MARINE REVIEW.

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To Prevent Accident at the Encampment.

The announcement in a dispatch from Washington that the chief of the revenue cutter service had issued new rules for the navigation of the Sault river not wholly correct. The revenue cutter officials have simply arranged for a display of signals at Johnson's point, with a view to preventing accidents that might occur on a bend in the river at that point. It is understood that the expense of erecting a station for men who will display these signals will be borne by the so-called McCurdy-Prime insurance syndicate. A circular letter pertaining to these signals has just been received from the chief of the revenue cutter service. It is dated Sept. 13, signed by W. B. Howell, acting secretary of the treasury, and is as follows:

The following additional regulations in relation to the movements of vessels in the St. Mary's river are hereby promulgated for the information of all concerned:

"Hereafter whenever a steamer bound down the St. Mary's river in the day time enters the "Dark Hole" a white flag will be displayed on a pole at Johnson's point, Sailors' Encampment, in said river, until the steamer is abreast of Johnson's point; and whenever a steamer having a vessel or vessels in tow, bound down in the day time, enters the "Dark Hole," a white flag over a red flag will be displayed on the pole until such towing steamer is abreast of said point.

"Whenever a steamer bound down said river at night enters the "Dark Hole," a white light over a red light will be displayed on said pole; and whenever a steamer bound down at night, having a vessel or vessels in tow, enters the "Dark Hole," a white light with two red lights under it will be displayed on the pole.

"No flags or lanterns, however, will be displayed for tug boats without tows or for small vessels.

"The rule requiring steam vessels to sound one long blast of the whistle at Rain's buoy and Everen's point, will remain in force."

Bids on Breakwater Piers.

Proposals for the building of two breakwater piers at the Lake Superor entrance to Portage Lake ship-canals were opened on the 10th inst. in the office of Major Clinton B. Sears, United States Engineer, at Duluth. Following are the totals of bids (exclusive of stamp sand to go into the work), submitted by ten firms:

BIDDERS.	TOTAL FOR NORWAY PINE.	TOTAL FOR WHITE PINE.
Porter Bros., Duluth, Minn	280,953.20	$288,639.60
Lydon & Drews Co., Chicago, Ill	309,680.00	315,650.00
The L. P. & J. A. Smith Co., Cleveland, O	323,751.60	329,231.60
McArthur Bros. Co., Chicago, Ill	356,080.00	365,040.80
Heldmaier & Neu, Chicago, Ill	.....	364,340.00
Chicago Star Contracting and Dredging Co., Chicago, Ill	311,120.00	318,080.00
Joseph J. Churchyard, Buffalo, N. Y	355,524.00	363,518.00
Robert Gregg, Sault Ste. Marie, Mich	307,340.00	313,938.00
I. V. Hoag, jr., Pittsburgh, Pa	389,080.00	389,080.00
Powell & Mitchell, Marquette, Mich	328,706.00	335,286.00

In secton 1 of the work there is about 3,800 lineal feet and in section 2 about 1,680 lineal feet, and the totals of bids above noted are for either Norway or white pine in the superstructure and top two courses of piers. Porter Bros., who are the lowest bidders, offer Norway pine in section 1 at $63.55 per lineal foot and white pine at $65.25. Their bids on section 2 were based on $23.49 per lineal foot for Norway pine and $24.22 for white pine.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, Sept. 11, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	2,034,000	16,150,000
Duluth	980,000	181,000
Milwaukee	57,000	212,000
Detroit	246,000	29,000
Toledo	587,000	593,000
Buffalo	464,000	1,954,000
	4,368,000	19,119,000

As compared with a week ago, the above figures show, at the several points named, an increase of 246,000 bushels of wheat and 2,911,000 bushels of corn. On the same date there was afloat on the lakes 1,867,000 bushels of wheat, 4,850,000 bushels of corn and 1,139,000 bushels of oats. Grain afloat on the canals aggregated 208,000 bushels of wheat, 1,514,000 bushels of corn, and 70,000 bushels of oats.

No Shortage of Hard Coal.

Some vessel owners may be misled by newspaper dispatches reporting a shortage of hard coal at the head of Lake Superior. It is probable, of course, that some hard coal will be shipped out of Buffalo and Erie as usual until the close of the season but there is no shortage in the shipments up to this time. The movement through the canals at Sault Ste. Marie to Sept. 1, was, in fact, 296,183 tons, which is 72,000 tons in excess of the total on the same date a year ago. The Lake Superior hard coal movement is not a big item anyhow, as it has averaged little more than 400,000 tons for the past three seasons.

System of Fog Signals.

Numerous systems of signals to lessen the dangers of navigation in fog have been suggested. All of them are meritorious from a naval point of view, but they fail in practice. The latest is from Prof. E. C. Pickering, director of Harvard college observatory, who presents a method of determining the position of a vessel in a fog based upon the velocity of sound. If two fog horns of different pitch be placed at equal distances from the middle of a channel or entrance to a harbor, and be sounded simultaneously at regular intervals of about a minute, Prof. Pickering says, it will be evident, that a captain of a vessel will be able to locate his position with fair accuracy by noting when the sounds of the horns are heard. If the two sounds are heard at the same instant, the vessel will be in the middle of the channel, and if they are heard after one another, it would be possible to judge from the interval between the two how much the vessel is out of the middle of the channel. For vessels passing one another, Prof. Pickering suggests that each should whistle or blow the horn or siren as soon as the sound is received from the other vessel. Then, if they are five miles apart, each will whistle every fifty seconds, and the distance in miles between the two vessels can always be determined by dividing the intervals in seconds by ten. It is claimed that by placing two different fog whistles on a long steamer, one at the bow and the other at the stern, and arranging that the sounds emitted by both should be heard together by an observer standing at the bow, many collisions might be prevented. Instructions could be given to sailing vessels to keep quiet so long as both signals were heard separately, for they would then be in no danger, but to fire a gun or make other loud noise when both whistles were heard together, for they would then be in front of the steamer. These various methods may be combined indefinitely, according to a circular pertaining to the system, but it is probable that the signals will never be given a trial as they are too complicated, which is the objection to all such systems.

Equal to an Advance of Five Cents a Ton.

A rise or fall of 5 cents a ton in ore freights is a matter of great importance to vessel owners. The first of the recent 5-cent advances was like a drink in a thirsty land. How much more interest should be attached, then, to a permanent advantage of 5 cents a ton over going rates throughout the season? An engineer who is given to careful calculations regarding the cost of carrying freight on the lakes figures that a reduction in fuel bills of the steamer Kaliyuga, due to the application of the Howden hot draft, changes in engines, etc., is equal to an addition on the business of the ship for the season of 4 to 5 cents a ton in ore freights. Some owners who have had vessels equipped with this apparatus refuse to tell just how much it is saving for them, on the claim that they are at an advantage in carrying freight so much cheaper. They do not believe in paying for experience for the benefit of the other fellow. In the case of the Kaliyuga, however, figures have been given out, and from them the calculation referred to has been made.

The steamer Continental was equipped with Howden draft in time to go into commission early this season. Officers of the Republic Iron Co. state that before being fitted with the draft she burned 234 pounds of coal per mile and 1,871 pounds per hour, running 8 miles an hour. This season she runs 8.39 miles an hour with 171 pounds per mile and 1,434 pounds per hour. With the new draft run of mine coal is used instead of lump and a saving in fuel bills secured on this account also. These two facts reduced to figures will, in the case of the Continental also, show a saving equal to 5 cents a ton in ore freights. Claims of this kind are certainly worthy of careful consideration from vessel owners.

Merchant Marine of the United States.

Advance proofs from the statistical report of the United States commissioner of navigation again show that the greatest gains in vessel tonnage are on the Great Lakes. The increase in tonnage on the lakes makes up for losses in other parts of the country. Thus it is shown that during the year ending on June 30 last the increase of vessel tonnage throughout the country was only 65,400 gross tons while on the lakes it was 86,000 tons. The difference of about 20,000 tons represents a decrease on the Atlantic and gulf coasts. Pacific coast tonnage was virtually stationary.

The documented merchant marine of the whole country on June 30, 1897, numbered 22,633 vessels of 4,769,020 gross tons. The tonnage of the Atlantic and gulf coasts is 2,647,296, while that of the lakes is 1,410,103. The steam tonnage on June 30 amounted to 6,599 vessels of 2,358,558 gross tons, an increase of 51,000 tons over the previous year. Nearly all of this increase is on the great lakes, where steam vessels number 1,775 of 977,235 tons. The average tonnage of steam vessels on the lakes is, therefore, 551, which is quite large when it is considered that the compilation includes harbor tugs and other small vessels.

New York state has the largest merchant marine, 4,857 vessels of 1,331,743 gross tons, an increase of 27,000 tons. The state exempts from taxation its tonnage in foreign trade. Michigan ranks second with 1,132 vessels of 477,602 tons. Ohio vessels are the largest and most modern, numbering 558, of 390,052 tons. Maine's fleet numbers 1,871 vessels of 299,592 tons. Steel and iron vessels number 1,023, of 1,207,222 tons, an increase of 117,000 tons. During the year sixty-eight iron or steel vessels of 124,395 tons were built and documented. Vessels registered for foreign trade number 1,230, of 805,584 tons.

SHIPS THAT PASSED DOWN TO THE SEA.

OLD-TIME LAKE VESSELS THAT MADE OCEAN VOYAGES.—MEN WHO COMMANDED THEM.—SOME WERE SOLD IN ENGLAND, AND NEVER RETURNED TO THE LAKES.

Believing that an article in the Review detailing the names of the old-time lake vessels that have made ocean voyages will be received with interest by the readers of your valuable paper, I have taken this occasion to get together data as complete as is possible to be had. The hardy ocean mariner is often prone to deprecate the dangers of the fresh-water sailor, but the long list of old time skippers who have dared to meet all the evils of sea voyages and bring their vessels into port right side up, will go far to prove that lake captains and the lake-built vessels are perhaps equal—the one in seamanship and the other in staunch construction—to their salt water brothers and the ships constructed especially to sail on the deep blue sea.

The following extract is taken from the Cincinnati Atlas, of November, 1843: "We noticed yesterday at the upper landing the two-masted schooner Dolphin, Captain Doyle, from Buffalo, N. Y., loaded with whitefish and bound for New Orleans. She entered the Ohio river via Cleveland, through the Ohio canal, and is probably the first schooner that ever floated from the waters of Lake Erie to the Ohio river."

The first lake vessel to cross the Atlantic ocean was the brigantine Pacific, under command of Captain George Todd, who was previous to his location on the lakes a salt-water navigator, in 1844. The Atlantic took on a cargo of wheat and flour from Toronto to Liverpool, making a successful voyage.

In the summer of 1845, the United States revenue cutter George M. Bibb, iron built, the material for which was gotten out at Pittsburg, and put together at Oswego, left the lakes for New Orleans, going by way of the rivers. On her arrival at Cincinnati she was placed in dry dock, where her submerged propellers were removed and side wheels substituted. She was en route to serve on the sea coast. In 1881 she returned to the lakes and went into service on Lake Ontario, engaged in picking up small craft under sail without proper lights.

In the spring of 1847, the United States revenue cutter Dallas, a lake-built vessel, left the lakes to do service in her line at the port of New York. The schooner Lillie, Captain Hunter, cleared from Kingston, in 1848, for Liverpool, with a cargo of flour and wheat, making good weather on her voyage. In the early days of 1848, the brig Michenice was launched from Oliver Newberry's ship yard at Detroit. During her career she made a voyage to sea and battled with the elements for upward of thirty years.

One of the notable episodes during the season of 1849 was the departure from Cleveland of the barge Eureka, for California, via the gulf of St. Lawrence, and with the exceptions above noted this was the first experiment in sending lake vessels on long sea voyages. The Eureka was owned by W. A. Adair, and took her departure in May, having on board fifty-nine passengers, and a full crew, under command of Capt. William Monroe. F. H. Freeman was first mate, L. D. Burwell supercargo, and Edward Beardsley steward. The voyage was a successful one, all being landed safely at the port of destination.

In 1850, the schooner Sophia, Capt. Gaskin, made an ocean voyage from Kingston to Liverpool. The propeller Ontario was the next craft to go down to the sea, making a successful passage around the Horn from Buffalo to San Francisco. In 1853, the schooner Cherokee, 400 tons burden, laden with flour and grain, made the passage from Toronto to Liverpool. She was under command of Capt. R. Gaskin, who had made a successful voyage in the schooner Sophia. This skipper also made the passage, Kingston to Liverpool and return, as master of the schooner Cataraugui, 550 tons, in 1854. He then, the same year, took out the schooner Eliza Mary for a like voyage. The barque Arabia, 450 tons, sailed by Capt. John Calder, also made a voyage to Liverpool out of Kingston the same year. The barque Reindeer was the next to try issues with the salted seas, leaving Toronto in 1855, and making a good passage. She now lies in the bone yard of the old river bed in Cleveland. But few of these early lake pioneers with the honors of sea voyages are now left, except they be in the condition above noted.

It may be remarked that the season of 1856 inaugurated the departure of a vessel from the upper lakes for an ocean voyage to Liverpool. This was the schooner Dean Richmond, with a cargo of wheat taken on at Milwaukee in July, and commanded by Capt. D. C. Pierce. Alike to the vessels that had preceded her from the lower-lake district, she had a prosperous voyage. The following season Capt. Pierce made the voyage from Detroit to Liverpool as master of the barque C. J. Kershaw, with a cargo of staves. It is said that this event was celebrated in a convivial way on the 22d of July, when she took her leave. The schooner Madeira Pet, which came to the lakes from Europe the previous season, also took on staves at Detroit, and took her departure August 10. These were the only clearances for Europe during the season of 1857.

But in 1858 the exodus of lake vessels numbered fifteen. Of these the following took cargoes of staves and oak lumber to London and Liverpool from Detroit; Barque Chieftain, 375 tons, Capt. Benjamin Wolvin; barque H. E. Howe, Capt. Day; brig Black Hawk, 384 tons, Capt. Alexander; schooner Col. Cook, 327 tons, Capt. Humphrey; schooner D. B. Sexton, 345 tons, Capt. Thomas A. Burke; schooner C. Reeve, 279 tons, Capt. G. M. Hall; schooner Harvest, 309 tons, Capt. Harvey Ramage; barque D. C. Pierce, 396 tons, Capt Thomas Kidd; barque C. J. Kershaw, 382 tons, Capt. Moore; schooner R. H. Harmon, 343 tons, Capt. Huntoon. The barque H. E. Howe, named in the foregoing list, was sold in London in 1860 for $7,500. The Black Hawk returned to the lakes and was lost at Point Betsey, Lake Michigan, in 1862 with a cargo of 19,000 bushels of corn. The schooner Col. Cook, another of the foregoing list, did not reach the Atlantic. She was wrecked on the Gulf of St. Lawrence and with her cargo became a total loss. The Col. Cook was owned by Geo. W. Bessel, of Detroit. The D. B. Sexton was also lost a year or two later. She was wrecked in the Straits of Gibraltar. There is also a clear record of the loss later on of the schooner Reeve, which sand off Oak Orchard, Lake Ontario, with a cargo of 13,500 bushels of corn while in command of Capt. Thomas Donahue. In this same year—1858—the schooner Correspondent, 294 tons, Capt. J. Morris, took wheat from Detroit to Liverpool, and the schooner J. F. Warner, 341 tons, Capt. A. R. Manning, took staves from the same port to Greenock. The barque P. J. Flood, 385 tons, Capt. Anderson, sailed from Green Bay with lumber for the West Indies, and another of the foreign departures was the barque E. S. Adams, 407 tons, Capt. Nelson, which took lumber from one of the Lake Ontario ports to Liverpool. But two or three of the men who took vessels out in this year are now living, among them Capt. A. R. Manning, who is well known as an insurance agent in Cleveland.

In 1859 there were shipped to England by lake vessels 692,057 West India staves, 142,662 standard pipe staves, and 474,693 feet of oak, walnut and pine lumber. This is exclusive of the cargoes shipped from Cleveland, Milan and Buffalo, statements from those places not being at hand. Your correspondent can not at this time obtain the names of the vessels taking out these cargoes, although there were about forty vessels engaged in the trade. Business on the lakes in 1860 was dull and therefore there was quite a demand for vessels to make voyages to the sea-coast and to European ports, thirty-nine vessels being employed in that trade. Six of these were large side-wheel steamers which were operated between Lake Ontario and the port of New York. Butts & Kendall, of Cleveland, received orders for thirty vessel loads of sterling coal for the manufacture of gas for New York City. The schooner Hibbard was six weeks making the voyage to New York. Several cargoes of walnut were shipped from Toledo to Boston and other Atlantic ports. Three tugs left the lakes for New York; one, the Sabino, a fine wrecking tug, went to New Orleans. The propeller La Crosse, went to Galveston, Texas, and the steamer Maple Leaf, of Kingston, to New York. Business improved naturally on the lakes in 1861 and this reduced the number of vessels going oceanward. Only five went down to sea, one of which did not reach her destination. Four of these vessels took out wheat cargoes. A representative of G. P. Bearse & Co., of Boston, came to Cleveland to order the construction of a vessel of 215 tons burden for the coasting trade. She was built by Ira Lafrinier and sailed the latter part of the season for Boston with a cargo of lumber. Five of the six revenue cutters employed on the lakes, all schooners of about 60 tons burden, were sent to New York City during this year, doubtless to play their part in the civil war just then coming on. They were all built at Milan and cost a good round sum, but were valueless for the purpose of cutters, on account of their small size and mode of propulsion. In the spring of 1862 the tug Oswego was sold at Detroit to New York parties and took her departure for the coast June 11.

Early in the season of 1863 the brig J. G. Deshler took on part cargo of copper at Bruce Mines for Liverpool and on arriving at Detroit she loaded staves, leaving the latter port for her ocean voyage May 27, in command of Capt. R. Stringleman. She made a good passage, returning to Detroit, Oct. 14. The Deshler was sold in Liverpool during her absence to Cunningham, Shaw & Co., and her name changed to Cressington. She brought back salt and pig iron. She again loaded staves at Detroit and sailed for Liverpool under command of Capt. John Jennings. After reaching salt water she was never heard from. On June 27, the Norwegian barque Sleipnn, Capt. Wage, arrived at Detroit with one hundred emigrants en route to Chicago. On her return voyage she passed down August 23, with a cargo of wheat. Her advent on the lakes was followed by a sloop with the sonorous name of Skjoldoman, from Bergen, Norway. She passed Detroit July 14, also en route to Chicago. On her return voyage she was freighted with provisions. As an offset to the encroachment of these two foreigners, the barque Ravenna, Capt. Malotte, made two voyages to Liverpool during this season. Her first departure from Detroit was on June 2, freighted with copper and staves. She arrived back at Detroit, Sept. 14, with salt, and four days later she sailed oceanward again loaded with staves, a notable feat in those days. One of the finest tugs that graced the lakes in 1863 was the Mary Grandy, built at Cleveland by Ira Lafrinier for the Winslows. She measured 325 tons. After brief service on fresh water she was sold to the United States government, taken to New York and renamed Balize. At the close of the war, in which she took an active part, she returned to the lakes and was placed in Murphy Bros., tug line at Detroit. During this season a requisition was made by United States authorities on Chicago for four tugs to serve on the Mississippi river instanter. Those taken were the Litle Giant, Dimi, J. S. Rumsey, and G. S. Sturgess. The price fixed upon three of these was $20,000, and on the fourth, the Little Giant, $2,000, to be delivered at St. Louis. This manouver pretty effectually closed up the old tug office at Chicago and retired from service in the various departments numerous clerks and other hangers on, and it is said that the fraternity were greatly dissatisfied. In 1864 a barque named Huron, 378 tons, was built at Port Huron for partes in Boston. On her completion she took her departure for ocean service.

Notwithstanding the high freight rates prevailing during the season of 1865, the lowest rate on wheat being 6 cents and the highest 19 cents, Chicago to Buffalo, many lake vessels entered the foreign trade. On April 12 the barque Thermutis and schooner Saranac loaded copper at Bruce Mines for Liverpool. The Thermutis, Capt. Charles Gale, after taking on some staves at Detroit, sailed on May 7, and the Saranac May 9. The Thermutis arrived back at Cleveland Oct. 1, with merchandise, and again departed for Liverpool, Oct. 25, laden with petroleum. On May 13, the brig Sea Gull sailed from Toronto, for Port Natal, Africa, with oak lumber. The barque C. E. Rosenburg, Capt. Bearse, sailed from Toledo for Boston, lumber laden. On May 15, the barque W. S. Pierson, Capt. Charles McMillan, sailed from Sandusky, for Hamburg, Germany, with a cargo of timber and staves; May 27, the brig Lucy A. Blossom, Capt. Lynn, left Detroit for Boston, with walnut lumber; June 10, the barque Wirralite arrived at Detroit from Liverpool with a cargo of merchandise. On the same day (June 10), the barque St. Clair, 380 tons burden, new and full rigged, was launched at Marine City for a Boston firm and departed for Boston, lumber laden. On June 12, the schooner Union left Detroit for Greytown, Nicaragua, with emigrants, and the barque Jessie Drummond departed from Port Stanley for Hamburg, Germany laden with walnut lumber. Then on June 28, the barque Wirralite, Capt. S. C. Jones, returned to Liverpool with copper from Bruce Mines; July 28 the schooner Clyde sailed from Sandusky for Boston, with walnut lumber; July 31 the barque Jaques De Molay, Capt. Mills,

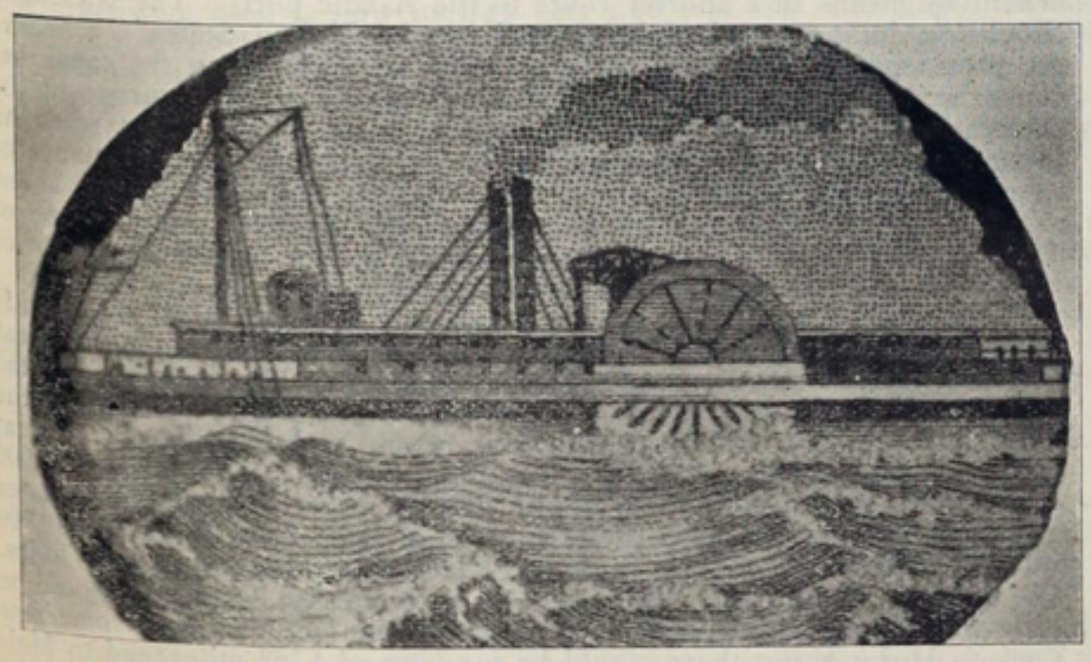
arrived from Liverpool with pig iron and salt; Sept. 15, the schooner Franzemontague passed Detroit en route to Chicago; October 17 the schooner R. N. Brown, Capt. Higgins, departed from Toledo for Boston, laden with walnut lumber.

During the season of 1866 the following vessels arrived at Detroit from Atlantic ports: Barque Thermutis, Capt. Charles Gale, from Liverpool with merchandise; schooner Saranac, Capt. Wraight, from Liverpool, en route to Chicago; barque Wirralite, Capt. S. C. Jones, from Liverpool with merchandise; brig Vidar, from Norway, en route to Chicago; barque Jaques de Molay, Capt. D. M. Tucker, from Liverpool, with merchandise; barque Etowah, from Liverpool with merchandise; schooner Ringgold, a wrecking vessel, from Pawgassett, Mass. The British gunboat Britomarte arrived at Windsor from Liverpool. The following departures are noted: Schooner Ellen M. Baxter, Toledo for Boston, with walnut lumber; schooner Saranac for Liverpool with 450 tons of iron ore from Bruce Mines; barque Jaques de Molay for Liverpool with a cargo of copper.

Shortly after the close of the war lake vessels gave up the foreign trade, and the few voyages made after 1866 are unimportant. It may be interesting, however, to note, as far as possible, what became of these vessels. The schooner Lilly, which sailed from Lake Ontario, was blown up while on the coast of Ireland, in 1859, with a cargo of gun-powder; brig John H. Harmon sold for $4,000 at Boston in 1860, and soon after lost between Cape Breton and Halifax; schooner Dean Richmond sold in Liverpool soon after her arrival out in 1856, price not stated; schooner Cherokee sold in Liverpool in 1853; barque D. C. Pierce, captured and destroyed by rebels in the spring of 1861 at Norfolk, Va.; schooner Cataragui, laden with railroad iron, sprung a leak and sank in Lake Ontario, 1864; barque Magnetta sprung a leak at sea and abandoned in 1860; schooner Republican wrecked on the island of Arbacatoa, April 26, 1860, and proved a total loss; schooner Grand Turk wrecked at Leland, Lake Michigan, in November 1869 and one life lost; schooner Kate L. Bruce sold at auction in Boston in 1859; schooner Twin Brothers foundered at sea in November, 1860; schooner W. B. Castle sprung a leak and was abandoned at sea, March 18, 1861; brig Sultan wrecked on Lake Erie in September, 1864, with loss of six lives; schooner Sophia Smith transformed into a barge, and was lost at Port Austin, Lake Huron, in September, 1874; schooner Ada, sprung a leak and sank at sea in December, 1861; schooner Sarah Hibbert sold in New York for $6,500 in 1860, and lost at Nagg's Head in March, 1861; schooner Indus converted into a brig and wrecked on the seaboard; barque Pride of Canada sold in Liverpool for $10,500 in 1850, and wrecked on Cariboo Island, St. Lawrence river, July, 1862; brig Black Hawk, wrecked at Point Betsey, Lake Michigan, October, 1862, with 19,000 bushels of corn on board; barque H. E. Howe sold in London for $7,500, in 1860; schooner Colonel Cook wrecked in the Gulf of St. Lawrence, in 1858; schooner Bridget wrecked at Long Point, Lake Erie, en route to sea in 1862; schooner C. Reeve laden with corn, sunk in Lake Ontario, in 1862; schooner D. B. Sexton wrecked in the Straits of Gibraltar, in 1862; barque E. S. Adams, wheat laden, sunk by collision in Lake Erie in 1863; schooner Sirius wrecked at Father Point, October, 1862; barque Mary Roe, wheat laden, sunk in Welland canal while en route to Atlantic; brig Hanover sold at Hamburgh, Germany, October, 1860; barque Ravenna wrecked at Cape Henry, in 1864, while enroute from Liverpool to Baltimore; brig Caroline sold in London, Eng., in 1860; schooner Owen Bearse wrecked on the Delaware breakwater, Atlantic coast, October 29, 1867; schooner R. H. Harmon, name changed to Waverthee in 1865, and wrecked in November, 1867, on Lake Huron; schooner M. S. Scott wrecked at Racine, with a cargo of grain in 1866; barque Vanguard, name changed to Wirralite, in 1865; propeller Detroit, returned to the lakes with name changed to Congress, and was wrecked at Thunder bay, Lake Huron, in 1873; schooner Junius, laden with walnut for Boston, lost off Long point, Lake Erie, September, 1866; schooner St. Helena lost on the coast of Africa in the winter of 1861; schooner Clifton sold in New York for $2,000; schooner Kyle Spangler wrecked on the Atlantic coast; steamer America wrecked on the coast of Texas; steamer Peerless condemned at New York City; schooner Messenger condemned as unseaworthy at New York in 1871. A. A. P.

A Relic of the E. K. Collins.

Nearly fifty years ago the steamer E. K. Collins, a passenger vessel engaged in the trade between Lake Erie ports and Buffalo was burned in the Detroit river near Bois Blanc island with great loss of life. Only a few of the pioneer vessel men of the lakes have any recollection of the



accident, and yet the illustration presented herewith is a reproduction of a picture of the steamer on a broken bit of crockery picked up on the beach at Bois Blanc island recently by one of the sons of Capt. Andrew Hackett, well known as the keeper of the island light and other aids to navigation in the vicnity of Amherstburg. It is quite probable that all of the crockery and china of the E. K. Collins was marked by a picture of the vessel. The E. K. Collins was built in 1853 at Newport, now Marine City, and was burned in the following year. Although the vessel was beached on the Canadian shore opposite Bois Blanc island after she had taken fire, and was not subjected to any great stress of weather in that locality, the panic among passengers is said to have caused the death of some of them in water shallow enough to permit of their walking ashore.

A Large Shipment of Anchors.

The accompanying illustration represents a car load of anchors, weighing 12,000 pounds, of the Baldt stockless type, and equipped with a special buoy shackle, which can be seen attached at the backs of the anchors. These anchors are for the largest clam shell dredgers ever built on the lakes, which Dunbar & Sullivan now have under way at Buffalo, and which are for dredging in 75 feet of water in connection with the big Buffalo

breakwater contract. In this great depth of water, it is impossible to use spuds as is generally done, and for this reason the dredging firm has adopted the Baldt anchor, which, with the special buoy shackle, will make them the most convenient and strongest anchor they can use. This shipment of anchors as well as several other large orders for the lakes that have been placed of late with the Baldt company (Chester, Pa.), speaks well for the popularity of their anchor.

Government Armor Plant.

The board of naval officers appointed to investigate the subject of a government armor plant will probably be in session in Washington until Dec. 1, and will prepare two general sets of plans—one for the establishment of an armor making plant, and another for the erection of an open hearth plant for the making of the steel itself—but it is the general opinion after all that the investigation will not result in anything more than the collection of reliable information on the subject. Most officers of the navy are of the opinion that the secretary will not at this time recommend the establishment of a government plant. One of them is thus quoted by the Army and Navy Journal:

"I have reason to believe that if congress will, at its next session, increase the limit of price on armor to $350 or $400 per ton, the Carnegie and Bethlehem companies will bid on that basis. I understand on good authority that these companies now regret that they did not accept the compromise offer of $400 made by the secretary. In considering the whole question much depends upon the number of new battleships that are to be authorized to be built in the near future. If we are to go on toward the realization of a great naval power like that of England, the erection of a government plant will be necessary and economical. If, on the other hand, we are going to build only a few more big ships for the present, I am sure it would be cheaper and more satisfactory to purchase armor of the established plants, as has been the custom. When these plants were erected the navy contemplated the building of a comparatively large number of ships. Most of these are now completed; we need armor now for three, the Illinois, Alabama and Wisconsin, and we may build a few more. I suppose the secretary will ask congress for an appropriation for another battleship or two and some additional torpedo boats. His ideas of economy, I understand, are to have a large number of available ships but to keep most of them out of commission, laid up in reserve. It is an open question whether congress will appropriate much money for ships which are not to be in active service. I do not believe that any corporation would undertake to build a new armor plant at this juncture, though possibly the Illinois Steel Co. might make overtures if new advertisements should be issued. A government armor plant might serve a useful purpose in regulating prices, but I do not think there would be a great saving in its establishment unless extensive additions to the navy continues to be made."

The Review has excellent photographs of lake ships.

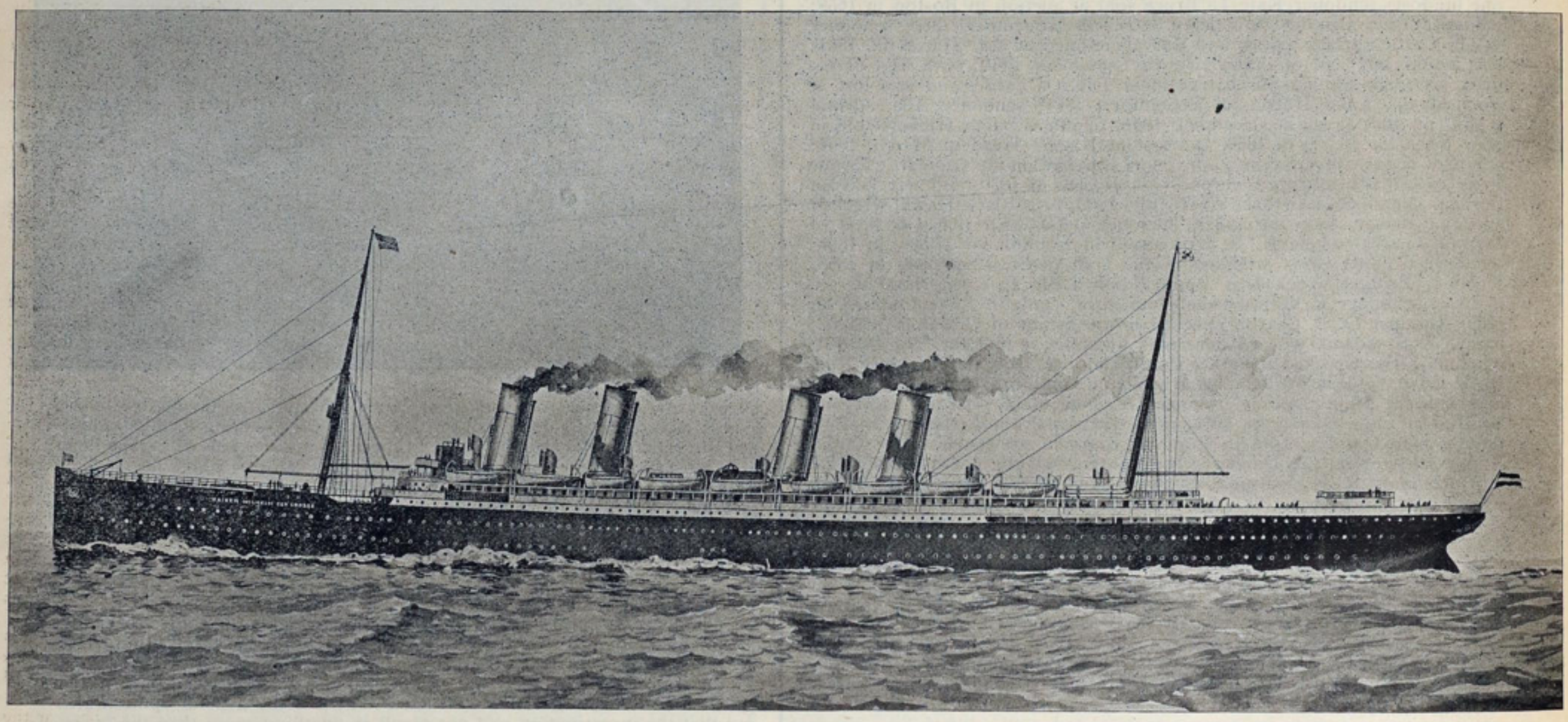
The Big German Ships.

Upon the arrival in New York, a few days hence, of the new North German Lloyd steamer Kaiser Wilhelm der Grosse, interest will again be manifested in the subject of fast Atlantic liners. Until the completion of the 700-foot White Star liner building at the works of Harland & Wolff, in Belfast, this German steamer will attract attention as the biggest ship that floats. An illustration of the Kaiser Wilhelm, made from builders' plans, and showing her great dimensions with four smoke stacks of 12 feet diameter and 106 feet height, appeared in the Review of March 25, but a complete description of the ship was not available at that time. She was built for the North German Lloyd Co.'s Bremen-New York service at the Vulcan works, Stettin. Her principal dimensions are: Length between perpendiculars, 625 feet; beam, 66 feet; depth, moulded, 43 feet. The length on deck is 649.6 feet, load displacement about 19,684 tons, and gross registered tonnage 13,800. The vessel was built as a four-deck steamer under the requirements of the German Lloyd's, and those of the government for an auxiliary cruiser. There are sixteen athwartship bulkheads, reaching to the upper deck, and one fore-and-aft bulkhead in the engine room dividing the vessel into eighteen main watertight compartments. The double bottom runs nearly the entire length of the vessel and is divided into twenty-two compartments. Bilge keels are fitted. The vessel has accommodation for about 400 first-class, 350 second-class and 800 steerage passengers and a complement of 450 officers and men. There are two steel pole masts for schooner rig, four funnels, and twenty-four steel boats. The bunker capacity is about 4,500 tons.

The twin-screw engines are of the four cylinder, four crank, triple expansion type, balanced on Schlick's system, and are to develop between 27,000 and 30,000 indicated horse power. The cylinders are high pressure 52 inches, intermediate 90 inches, and low pressure (two) 97 inches diameter, the stroke being 68.9 inches. The working pressure of the boilers is about 185 pounds per square inch. The engines are designed for seventy-seven revolutions per minute, with the cut off at .72 of the stroke. There are, including all auxiliaries, sixty-eight separate steam engines with 124 steam cylinders on the ship. The main feed pumps are of the Weir type. The twin air pumps, one for each engine, are of the Blake type, having each two double-acting steam cylinders, 18 inches in diameter, and two single-acting cylinders 44 inches in diameter, the stroke being 24 inches. The steamer is also furnished with a full outfit of auxiliary feed, fire and bilge pumps, in all nine pumps, all of the vertical simplex type, and manufactured by the Blake company.

There are twelve double-ended eight-furnace boilers, and two single-ended four-furnace boilers, arranged in four groups, with one funnel for each group. Each funnel is fully 12 feet in diameter, and its top is 106 feet above the keel. The propellers are of bronze, three-bladed, 22.21 feet in diameter, and have a pitch of 32.8 feet. The launching weight of the ship was 8,021 tons. The crank shafts are built up of Krupp's nickel steel, with a tensile strength of 88,580 pounds per square inch, and an elongation of 20 per cent. Each crank shaft is 45.81 feet long, and composed of four sections, each 11.45 feet long. The crank shaft and pins are 23.62 inches in diameter, with a 9.45 inch axial hole. The cranks are 15.75 inches thick, and have circular ends and sides, formed with a radius of 15.75 inches from the center of the crank pin. There are two coupling discs on each section, 40.9 inches in diameter and each 6.3 inches thick, and each fitted for fourteen coupling bolts. The distance between the coupling disc and crank face of each section is 25.79 at one end and 41.17 at the other. The total weight of each crank shaft is 81.98 tons. One of the novelties in the ship is four small dining rooms named after William the Great, the Empress Augusta, Prince Bismarck, and General von Moltke.

Another of the several steamers building for North German Lloyd company will aso rank among the fastest of the Atlantic liners. This is the Kaiser Friedrich, building at the Schichau works, Dantzic, which is a trifle less than 600 feet in length, but which is expected to attain a speed of 22.5 knots. She will have accommodations for 274 first-class and 780 steerage passengers. Her twin-screw engines will be of the five cylinder quadruple expansion type; the high pressure 43.3 inches diameter; high intermediate, 64.2 inches; low intermediate, 92.1 inches, and the low pressure (two) 93.3 inches diameter; length of stroke, 66.9 inches. Each engine is expected to develop about 12,000 indicated horse power. There will be nine double-ended and one single-ended boiler, arranged in three compartments, with three funnels. The diameter of the boilers will be 16.73 feet, and the thickness of shell plates, 1.246 inches. The total grate surface will be 76,430 square feet. The working pressure will be 220 pounds per square inch.



Kaiser Wilhelm der Grosse.
THE LARGEST STEAMSHIP IN THE WORLD.

President Favors Nicaragua Canal Project.

Dispatches from Washington would indicate that the administration is favorable to the Nicaragua canal project. The Bureau of American Republics is about to issue a bulletin on the subject, and Director Smith of that bureau says it is quite probable that the president will do all in his power to prosecute the canal enterprise.

"The president," says Mr. Smith, "has already appointed a commission under a recent act of congress appropriating $150,000 to continue the survey with a view to selecting the proper route and ascertaining the feasibility and cost of construction of the Nicaragua canal. The object is to formulate complete plans for the entire work of construction. In my opinion, the matter will be pressed upon the attention of congress as a national undertaking, with the object of securing not only great commercial advantages to all of the American republics, but that distinctly American control of waterways between the Atlantic and Pacific, which is so important, in both a diplomatic and a military sense, to proper enforcement of the Monroe doctrine. I have no information as to the president's attitude toward the enterprise except such as may be obtained by anyone from his public acts and uterances. The republican national benefit by means of a shorter route to the Asiatic ports. The Nicaragua should be built, owned and operated by the United States.' I believe the president will be found to be an advocate of building the canal, because he has shown so unmistakably his desire to fully carry out the declarations of his party, and also because I am satisfied that when he comes to consider teh subject he will be impressed by the importance of an enterprise which, for many years, has been advocated by the ablest minds of both the great political parties, and presents itself as one of the necessary features of a strong policy to secure American control of American interests without any outside interference.

"One of the most interesting facts in connection with the Asiatic trade is the remarkable advancement of Russia by means of the great Siberian railroad into the northern part of China. The completion of the railroad will give an immense impetus to Asiatic trade, from which the countries of the two American continents would undoubtedly receive great trading to the Pacific ports the advantage of from 3,000 to about 10,000 route offers to the commerce of the eastern ports of the United States trading to the Pacific ports the advantage of from 3,000 and about 10,000 miles in distance saved, and to those of Europe from 1,036 to 6,100 miles. The distance saved from New York by water to San Francisco would be 9,394 miles; from Liverpool to San Francisco, 6,996 miles; from New York to Hong Kong there would be a saving of 4,163 miles, and to Melbourne, Australia, 3,290 miles. These economies in distance might be multiplied almost indefinitely, and there seems to be no queston whatever of the vast commercial importance of the canal."

Who Stands the Loss?

"In nine cases out of ten," says a Cleveland vessel owner who is known to be very careful in keeping up his fleet, "fires on lake ships are due to cheap old lamps and to carelessness in handling oil. Every fall I go aboard my vessels and throw the lamps overboard. New ones, and good ones at that, are bought in the spring. If there is any oil or other dangerous stuff lying about in the fall it goes overboard, too. This may seem like an extravagant policy, but it pays in the long run, if for nothing more than the impression it leaves with the men regarding their duties in guarding against fire. Still, I get my insurance no cheaper than the fellow who goes along on the principle that it is the insurance company that pays losses and that he should work underwriters for all he can get out of them. But a change is bound to come soon. We will some day be dealing with underwriters on the sound business principles that are working into other lines of trade, and the vessel owner who is always trying to avoid losses because he knows that the ship pays for them in premiums in the end, will be credited with good judgment.

"And I want to make another prediction with reference to the matter of repairs following accidents. The dry dock company or ship building company that first takes steps to collect information that will permit of bids being made on repair work will be proceeding in the right direction. It may take some time and considerable expense to gather information of this kind, so as to have an advantage over competitors, but in the long run the company that does it will be repaid for its labors. There is no use saying that it can not be done, as it is done elsewhere, and certain ship owners as well as the underwriters are getting ready to demand it. Only the other day I read a lengthy correspondence between certain underwriters, and one of the big ship-owning firms of Cleveland on this subject. It was based on a conversation which the ship owner had with a dry dock manager. The latter declared that the insurance companies were paying the losses, and the question of price was not one in which the vessel was interested. Of course, the ship owner could not see it in that light, and as a result he is stirring the whole subject up with his underwriters.

To Do Away with Lead and Line.

A New York vessel captain, Capt. Ferdinand Foster, has a machine that is designed to make a back number of one of the oldest of the sailor's implements—the cord and weight used from time immemorial to test the depth of water in which a ship is sailing by means of the process known as heaving the lead. The device is thus described in the New York Herald:

"It consists of an oblong piece of metal, fitted with fins at the top and bottom and sides. The fins are fitted to enable the contrivance to sink to the deepest depths of water. The great superiority of this idea over the old method consists in the fact that instead of having to be thrown overboard at intervals, the new device can be suspended at the exact depth of water that a vessel must draw to be perfectly safe, and left in that position while the ship is moving through the water. The floating piece of metal is connected with the ship by means of an electric wire, which not only registers the depth of the water on the dial in the pilot house, but if the implement strikes any obstruction or touches the bottom instantly announces the fact, so that the pilot is enabled to act accordingly. In addition to this it is possible by means of this device to tell exactly the kind of material of which the bed of the ocean or channel beneath the ship is composed. The method is extremely simple. An ordinary telephone receiver is connected with the wire that runs to the depth tester, and when the latter touches bottom the pilot is enabled to tell the nature of the bottom by the sound that he hears on the receiver. If the metal touches a clay bottom on a sandy soil the sound will be smooth, without jar or friction; but if the ship is traveling over a rocky bed the sound that comes to the receiver will be harsh and grating as the metal device bumps over it. The device will sink to almost any depth, its action in the water being like that of a kite in the air. The greater the speed of the vessel the swifter and deeper the metal will sink, the angle at which the fins are arranged carrying it down as the water strikes them during the progress of the vessel. The sinker weighs ten pounds, and is 45 inches in length.

Right Kind of Recruits from the Lakes.

Officials of the navy department are said to be especially pleased with the work of Lieut. Comdr. John M. Hawley in securing recruits on the lakes. More than 200 enlistments have been made during the past three months at Duluth, Chicago, Milwaukee and Detroit, where stations were established for the purpose. Lieut. Hawley, with the officers who are assisting him, is now in Bay City and will visit Cleveland, Buffalo and probably other places before leaving the lakes. The department is pleased with the large number of intelligent mechanics picked up on the lakes. On the Atlantic coast the mechancs who can be secured for the navy are, as a rule, lacking in sea experience, but the men enlisted from lake ports have had experience on board ship as assistant engineers, oilers, firemen, etc., and are just the men needed on modern men of war.

In all fifty-eight persons were enlisted at the Detroit station, which was closed a few days ago. Of this number, seventeen were boys between fourteen and sixteen years of age, who go as apprentices. The other forty-one men enlisted were sixteen ordinary seamen, four seamen, five landsmen, nine machinists of the second class, two machinists of the first class, two firemen of the first class, two firemen of the second class, and one coal passer.

Petroleum on Passenger Steamers.

In answer to an inquiry made recently by S. L. Moore of St. Paul, general freight agent of the Northern Pacific Railroad, the United States treasury department says:

"You are informed that, if the Canadian passenger steamers Empire and Monarch, referred to in your letters, run direct from Sarnia to Duluth without touching at any intermediate United States ports to take on passengers from such ports, the question of those ships carrying petroleum oils is a question wholly to be determined by the Dominion government. If, however, the steamers referred to desire to take on passengers from United States ports en route between Sarnia and Duluth, collectors of customs at such ports can not clear the steamers with a full or partial cargo of petroleum oils on board, for the reason that there are other practical routes for the carriage of such oils, unless it can be shown that the additional cost for such other practicable routes of carriage amounts to a prohibition of the traffic in petroeum oils between the ports named. In previous decisions of the department, on the subject of the carriage of petroleum oils (8795, April 23, 1888), it was held, in the case of United States passenger steamers running from Detroit to Mackinac island and St. Ignace, that if there are sailing vessel or freight steamers running regularly between the ports named, 'it would be illegal for passenger steamers to carry refined petroleum;' but if there were no freight steamers on the route named, then 'the carriage of petroleum on passenger steamers would depend (as heretofore stated) upon whether the tariff of freight' by rail route was so high 'as to amount to a prohibition of the traffic in refined petroleum.' In conclusion, you are informed that it is the opinion of the department that the tariff on other existing practical routes for the carriage of petroleum oils between Sarnia and Duluth, via United States ports, is not prohibitory."

Old Range Lake Superior Mines

In a paper pertaining to the iron ore supply of the United States, presented by John Birkinbine of Philadelphia at the recent meeting of the American Institute of Mining Engineers, several tables of statistics are used to prove that the older ranges in the Lake Superior region have not been crowded out of business by the later additions, but rather that the increased demand has been met by the newer ranges. The competition which followed the opening of new mines has demanded that economies be practiced by all, and much of the ore which has been supplied from the younger ranges could have been furnished by mines opened before these districts came into notice. Each range is now making the most of its natural advantages and endeavoring to discount its drawbacks, whether these are in the character or quality of ore, the distance of rail and water transportation, the method of mining, or the charges for interest on capital invested or for royalties. Some of the old-range mines that were important producers show signs of depletion, but in a number of cases new finds have increased the apparent reserves, and we may therefore consider, Mr. Birkinbine says, that each of the five ranges now embraced in the Lake Superior region will continue to supply ore, even if as great surprises await the future explorer as have startled the metallurgical world in the past. It may be concluded also that while the contest for local supremacy has been severe, the results have affected mines in other sections of the country even more seriously than on the several ranges.

But the most interesting feature of Mr. Birkinbine's paper is his reference to the fact that athough the average transportation by rail and water between mines and the furnaces exceeds 800 miles, the efforts of the mining engineer, the mechanical engineer, the civil engineer and the marine engineer have brought about the present marvelous development of the Lake Superior region. "Forty years ago," he says, "when the first shipments of iron ore were made from the Lake Superior region, the supply for the blast furnaces active at that date was in most cases a local consideration, the majority of the smelting plants being close to the ore mines. Of those which depended in whole or in part upon ores brought from distances greater than an economical wagon haul, few obtained supplies by canal or railroad from points removed fifty miles. At the present time the ore supply is a local consideration for only a small number of American blast furnaces, and 1,000 miles or more separate a greater number from the mines producing the ore in 1897 than was supplied in 1857 with ore carried fifty miles. It is not necessary to detail the wide distribution of ores from the Lake Superior region, which now contributes five-eighths of the annual production of domestic iron ore, but it will suffice to state that, taking into account all of the ore mined in this district, the average transportation by rail and water exceeds 800 miles between mine and furnace, and probably three-fourths of the ore mined is subjected to three and sometimes four transfers between the time the loaded cars leave the mine and other cars deliver the ore at the furnaces. That is, a large proportion of the ore mined in the Lake Superior region is loaded on cars, which, after covering fifteen to 100 miles of railroad haul, are discharged into the pockets of ore docks; these pockets hold the ore until vessels are ready for cargoes; when the receiving docks of the lower lakes are reached the ore is removed from vessels on to cars or placed in stock piles, from which cars are loaded subsequently as the consumers require the ore and unloaded at the furnaces. If in addition we consider the loading of ore below ground in mine trams and skips, the hoisting of the same to the surface, the dumping of skips into shipping pockets or stock piles (in some cases sorting the ore) and the subsequent loading of railroad cars at the mines, the number of tranfers of much of the ore obtained in the Lake Superior region is from five to ten. Where steam shovels are employed in open cuttings the handlings may be reduced, but notwithstanding this apparent economy ores can only be mined and carried for the distances above named by the employment of efficient machinery, appliances and management when the basis price of Bessemer ore (yielding, when dried at 212 degrees F., 63 per cent. of iron, and phosphorous 0.045 per cent.) at the receiving docks at the lower lake ports is $2.40 per long ton."

I. O. F. excursion to Conneaut and return, $1.25, Tuesday, Sept. 21 via Nickel Plate road. Special train leaving Cleveland 8 a. m. 320-Sept. 21

Collectors of marine photographs can secure a bargain from the Marine Review on two sets of representative lake steamers. There is a dozen in each set, consisting of the following lake steamers: Republic, Commodore, Frontenac, Fred Pabst, Spokane, Gladstone, Pontiac, Edwards and Golden Age, W. R. Stafford, Majestic, Tom Adams and W. F. Sauber. These photographs are 11 by 14 inches, picture size, taken at the mouth of the Detroit river. They have sold for $1.25 each, but in whole sets the price is now $6, considerably less than cost.

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30.	1891	204	111,856 45
" " "	1892	169	45,968.98
" " "	1893	175	99,271.24
" " "	1894	106	41,984.61
" " "	1895	93	36,352.70
" " "	1896	117	108,782.38
Total		864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered	17,219,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation	232	231	234	365	365	365

*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

A dispatch sent out from Duluth, a few weeks ago, stated that the John Scott Russell, one of the vessels of the Rockefeller fleet, had proceeded but a few hundred feet from the dock at Duluth, after loading ore, when she began to sink so rapidly that she could scarcely be beached. "It was found upon examination," the dispatch said, "that a large number of rivets in her hull had been cut off by the weaving of the hull when coming up the lakes without cargo in a heavy sea. When running light these long and comparatively flat and shallow vessels of the lake model have a tendency to work at the joints of the plates, and this had been enough in the Russell to permit leakage." Mr. L. M. Bowers, general manager of the Bessemer company, is evidently of the opinion that some harm may come from misstatements contained in this dispatch, which has been extensively published in the east, where the facts were not known. In a communication to one of the New York trade journals that published the dispatch he says: "I wish to say in regard to this matter that the barge John Scott Russell, after being loaded, was found to be taking water. Upon examination it was found that the engineer had left a valve open, which was closed and the vessel immediately pumped out dry. So far as the rivets having been broken off and being loose at the joints of the plates, there is not one atom of truth in the statement you make. The vessels is free from any defect whatever of that sort."

Proposals will be called for shortly by the navy department for a practice vessel—a bark—for cadets of the Annapolis naval academy. The hull will be of steel, the bottom sheathed with yellow pine and coppered. Dimensions are: Water-line length, 175 feet; beam, 37 feet; draft forward, 15 feet; draft, aft, 17 1-2 feet; displacement, 1,100 tons. The lower masts and lower yards will be of steel and the other spars of yellow pine or spruce, and she will spread 14,888 square feet of canvas, which it is expected will be enough to let her hold a pace with any other sailing vessel afloat. She will have accommodation for a commander, ten ward-room officers, two warrant officers, 180 cadets and ninety sailors, besides which she will carry an armament of six 4-inch rapid-fire guns on the gun deck, four 6-pounders and two 1-pounders on the spar deck. It is estimated that the vessel will cost $200,000. She must be completed within eighteen months. This vessel could pass from the lakes to the seaboard through the Welland and St. Lawrence canals, but lake ship builders are barred from competing for the contract on account of the treaty with Great Britain, about which so much has been said in the past when similar work was offered by the government.

Trials have recently taken place at Portsmouth, England, of two armor plates, each 8 feet by 6 feet 6 inches, manufactured by John Brown & Co., of the Atlas Works, Sheffield, for the British admiralty. The trials, which were undertaken to decide whether the plates would resist without serious cracking the impact of five Holtzer steel projectiles of 6-inch diameter and 100-pound weight, striking with a velocity of 1960 feet per second, were eminently satisfactory in their results. The back of the first plate showed on examination four small bulges, but it was practically free from cracks. The back of the second plate was equally good, except that one hole appeared where an extra shot, that was given purposely as an experiment at an obvious local defect, caused penetration. Of the six projectiles fired, all the other five were destroyed, leaving only shallow indents and no cracks on the plates.

Is it a compliment or a threat to this country that England is constantly strengthening her naval forces in American waters? Every ship on the North American and West Indian stations whose term of service expires is replaced by a more formidable one, and great sums are being expended in improving docks and harbor defenses. Why this display of strength? Surely it is not for the protection of Canada; the most hopeless pessimist in the Dominion can not fear an attack from the United States. But there is scarcely more reason to fear an attack on the United States by Great Britain. Probably the true and simple explanation is that the British government is building larger vessels now than it did formerly, and, having them on hand, is sending them to foreign stations in the usual routine.—Philadelphia Ledger.

Archibald Denny, of the famous Scotch family of ship builders, presents a few figures indicating the great amount of detailed calculation and design involved in the construction of a ship. The Southwark, a vessel 320 feet long, 40 feet beam and 29 1-2 feet hold, built by his firm is taken as an example. Her deadweight capacity is 4,500 tons on a draft of 23 feet. The steel work of this vessel weighed 4,300 tons; the number of separate plates and angles which had each to be ordered separately and of definite length, breadth and thickness was 17,000, and the number of rivets used to connect the various parts amounted to about 975,000. The total number of plans and tracings made for the ship's hull alone was 790.

Admiral Matthews, chief of the navy bureau of yards and docks, says that this country should have a large dock at Boston, another at New York, one at League island, Philadelphia, another at Norfolk, and one each on the Gulf and Pacific coasts. He is also of the opinion that there should be a dock at New London, Conn., or else at Gardiner's bay, at the eastern end of Long island. Admiral Matthews believes that such a system of docks, of capacity large enough to accommodate the heaviest war vessels, is absolutely necessary if the United States navy is to be built up and maintained in a first-class condition. The work, moreover, should be undertaken soon.

President Gates, of the Illinois Steel Co., is thus quoted: "We have about 750,000 tons of material sold as of Sept. 1, as against 230,000 tons sold Sept. 1, 1896, and about 431,000 tons sold Sept. 1, 1895. We have advanced our prices $3 per ton on some products within the last sixty days. Our mills are turning out the largest outputs at the lowest costs in the history of the company. We have 2,000,000 tons of ore on hand and to arrive at low prices, and believe the iron and steel manufacturers will be taxed to their utmost capacity for the next two or three years to fill their orders at considerably higher prices than are ruling to-day."

It would seem from the tenor of public documents coming from Washington during the past few months that an order has gone out in all of the departments to give publicity to everything pertaining the policy of protection for American shipping. If such is the policy of the administration, it is quite probable that some measure of legislation along this line will be secured at the next session of congress. All of the publications issued by the statistical bureaus of the treasury and state departments, as well as those of the bureau of American republics, contain of late numerous articles on this subject.

The future of the quadruple-expansion engine would seem to be largely dependent upon the perfecting of the water-tube boiler, as with the advent of a boiler of that type which will exhibit such a degree of economy, durability and facility of repair as to secure its general adoption, one of the chief causes now tending against the use of the quadruple expansion system, namely, the difficulty of obtaining boilers which can be economically built and successfully kept in continuous service under the required high pressure and temperature, will disappear.—Charles E. Hyde.

The recent fast trip of the steamer St. Louis—6 days, 10 hours and 14 minutes between Sandy Hook and the Needles—gives the record of speed both ways between Southampton and New York to the American line. This latest record trip beats the time of the Hamburg-American line steamship Furst Bismarck, made in September, 1893, by forty-one minutes. The St. Louis made an average hourly speed of 19.95 knots. Her sister ship, the St. Paul, broke all westward records from Southampton in August of last year, making the distance in 6 days, 31 minutes.

Assistant Secretary Theodore Roosevelt, of the navy belongs to the class of men who are not content with the satisfactory performance of routine duties in office. His latest effort to promote the interests of the navy is a remarkable little pamphlet entitled "American Naval Policy as Outlined in the Messages of Presidents of the United States." It deals with passages in the messages of presidents from Washington down to McKinley, in favor of the maintenance of a proper navy.

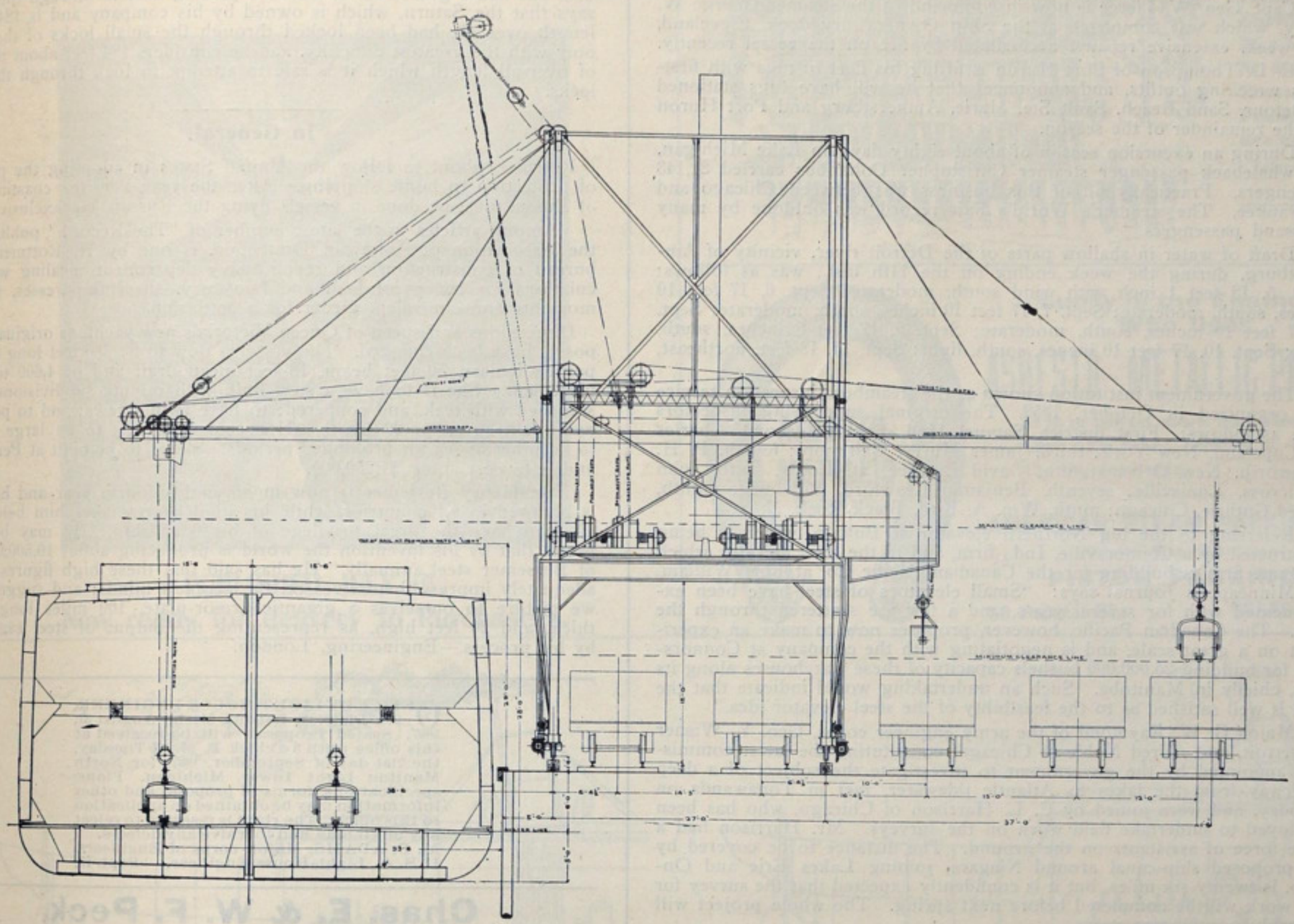
There are at the present time thirty warships under construction for the British admiralty, having a total tonnage of 252,395. Fourteen of these are building at royal dock yards, and sixteen at private yards, the respective total tonnage being 133,020 and 119,375. This is exclusive of thirty torpedo boat destroyers, of about 350 tons each, and eight shallow-draught steamers, all of which are being built by contract.

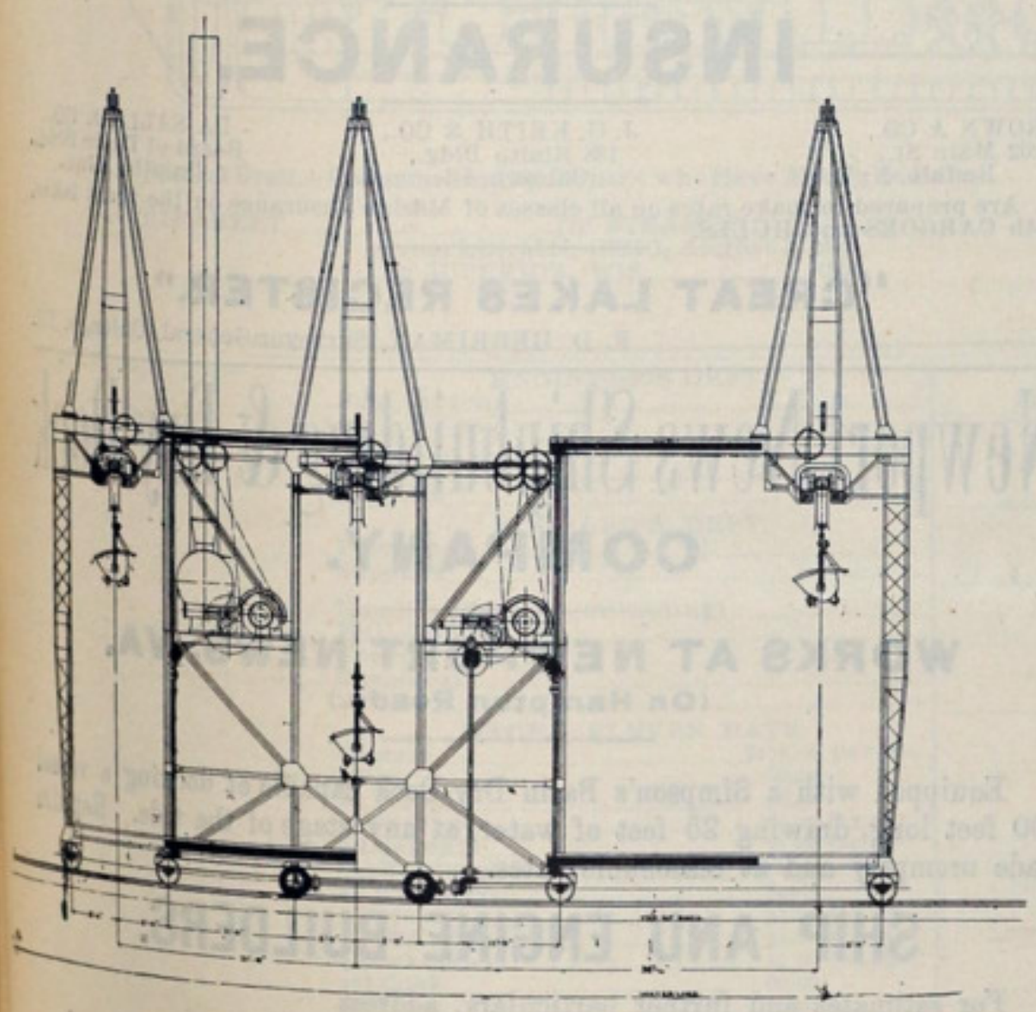
The output of pig iron throughout the country developed in a notable manner during August, so that on Sept. 1, the capacity at work represented a weekly make of 185,506 tons, against 165,378 tons on August 1. Unless special circumstances intervene the October return will show a further increase of consequence.

NEW ORE PLANT AT CONNEAUT.

MACHINERY DESIGNED TO UNLOAD FROM VESSELS CARGOES OF 6000 TONS IN SEVEN HOURS.

One of the several improvements for the rapid handling of cargo at Conneaut is an ore unloading plant, now under construction, that will result in another great reduction in the time and expense of removing ore from vessels and placing it into cars. The new plant will unload 6,000-ton cargoes easily within a working day; in fact, it is expected that the time required on vessels of the 6,000-ton type will not be more than seven hours, as against fourteen to seventeen hours now required on such vessels. The new plant consists of twelve legs divided into four groups of three machines each. It is being constructed by the McMyler Manufacturng Co., Cleveland, for the Pittsburg and Conneaut Dock Co., of Conneaut, and in connection with the new Carnegie railroad, equipped with steel ore cars, and the new car unloading and storage apparatus at the Carnegie furnaces, it will complete one of the most efficient systems for the rapid handling of raw material in iron that is to be found anywhere in the world.





This plant, illustrated herewith, is for direct loading into cars and does not contemplate the storage of ore in stock piles on dock. The illustrations with the following explanation will make plain the advantages of the system over those now in general use. The machine operates over five railroad tracks, two being spanned by the machine and three being under the boom or cantilever. The boom on the water end is similar to other appliances of its kind, except in two important respects. One is that the trolley can be stopped and lowered, without going into a lock, at any point over the vessel's hatch. The other is that the boom is of sufficient length to extend to the outer side of the vessel. Therefore one bucket can be lowered into the hold near the end of the hatch next to the dock and another near the outer side of the vessel. With the long boom the bucket on the outer side can be lifted perpendicularly and much more rapidly than if it had to be pulled from under the hatch coaming at a considerable angle. This will prove advantageous in returning empty buckets and also in lifting buckets from the side of the vessel next to the dock.

In other respects the machinery will also differ somewhat from hoisting plants now in use. The hoisting will be done direct from the engine, or crank-shaft, no gearing whatever being used. This insures less vibration and friction and the highest possible speed. The buckets will dump automatically at any height above cars on either of the five tracks. All these points may be noted by reference to the larger of the two illustrations.

The smaller illustration is an end view of one group of three machines, there being four groups in the plant. Each group will be entirely separate and self-contained. The boiler and one engine is on one side of the center pier and the two engines for the other legs are on the other side of the center pier. The operators will be in position to see all movements of the bucket except when it is under the hatch. Each group of three legs will be self-propelling. One new and valuable feature shown in this drawing is the rack and pinion device by which the two outer legs can be moved from a 21-foot center to a 36-foot center, to suit variation in the space between hatches. For instance, one of the twelve hatches, the forward one, in vessels of the Bessemer company's fleet is thirty-six feet from the next hatch. This arrangement will, therefore, save a great deal of time in the handling of these vessels, as the movement referred to is controlled by the operator and can be made in a minute.

It is expected that each leg in this plant will handle from sixty to eighty buckets an hour under favorable conditions. With twelve legs the extreme capacity of the plant would therefore be nearly 1,000 tons an hour, but if only 900 tons an hour is figured on the total of seven hours' work would be 6,300 tons. There is no question as to the necessary speed being attained with the machinery, as the McMyler company has a coal handling plant at New Orleans that operates ninety-six buckets an hour.

Home-seekers' excursions west, northwest and southwest are offered via the Nickel Plate road Sept. 21 and Oct. 5 and 19, at about one fare for the round trip. Inquire of agents. 316-Oct. 18

Around the Lakes.

About Jan. 1 two modern battleships, the Kearsarge and Kentucky, will be launched on the same day at the works of the Newport News Ship Building & Dry Dock Co.

John Stevenson of Detroit has bought the small wooden steamer Miami from Curtis & Brainard of Toledo. The Miami is a lumber carrier, 132 feet long. She was built at Marine City in 1888.

Not long ago fines amounting to some $1,500 were assessed by government officials against the steamer Ionia. Assistant Secretary Spaulding of the treasury department on Monday remitted all except $10.

Capt. Geo. W. Pierce is now in command of the steamer George W. Roby, which was completed at the Ship Owners' dry dock, Cleveland, this week, extensive repairs, necessitated by fire on the vessel recently.

C. D. Thompson of Port Huron is fitting his fleet of tugs with first-class wrecking outfits, and announces that he will have tugs stationed at Detour, Sand Beach, Sault Ste. Marie, Amherstburg and Port Huron for the remainder of the season.

During an excursion season of about eighty days on Lake Michigan, the whaleback passenger steamer Christopher Columbus carried 81,143 passengers. Practically all of this business was between Chicago and Milwaukee. The steamer's World's Fair record was outdone by many thousand passengers.

Draft of water in shallow parts of the Detroit river, vicinity of Amherstburg, during the week ending on the 11th inst., was as follows: Sept. 5, 18 feet 1 inch with wind south, moderate; Sept. 6, 17 feet 10 inches, south, moderate; Sept. 7, 17 feet 10 inches, south, moderate; Sept. 8, 17 feet 10 inches, south, moderate; Sept. 9, 17 feet 8 inches, south, light; Sept. 10, 17 feet 10 incnes, south, light; Sept. 11, 18 feet, northeast, light.

The government institution known as the steamboat inspection service was organized in October, 1852. The original supervising inspectors were as follows: First district, Samuel Hall, Boston; second, Charles W. Copeland, New York; third, James Murry, Baltimore; fourth, P. H. Skipworth, New Orleans; fifth, David Embree, St. Louis; sixth, John Shallcross, Louisville; seventh, Benjamin Crawford, Pittsburg; eighth, Alfred Guthrie, Chicago; ninth, Wm. A. Bird, Black Rock, N. Y.

Referring to the big Northern elevator at Buffalo, which is being constructed by a Connorsville, Ind., firm, and to the steel elevator which the same firm is building for the Canadian Pacific Co. at Fort William, the Minneapolis Journal says: "Small elevators of steel have been experimented with for several years, and a few are scattered through the west. The Canadian Pacific, however, proposes now to make an experiment on a great scale, and is negotiating with the company at Connorsville for building 25,000.000 bushels capacity of these warehouses along its lines, chiefly in Manitoba. Such an undertaking would indicate that the road is well satisfied as to the feasibility of the steel elevator idea."

Major G. W. Raymond of the army engineer corps, Geo. Y. Wisner of Detroit, and Alfred Noble of Chicago, constituting the latest commission appointed by the government to investigate the subject of a deep waterway from the lakes to Atlantic tidewater, met in Tonawanda on Tuesday, and were joined by C. L. Harrison of Chicago, who has been employed to undertake field work on the surveys. Mr. Harrison had a large force of assistants on the ground. The distance to be covered by the proposed ship-canal around Niagara, joining Lakes Erie and Ontario, is twenty-six miles, but it is confidently expected that the survey for this work will be completed before next spring. The whole project will probably occupy two years.

Capt. John L. Gallien, whose death at Racine was announced a few days ago, entered upon the life of a sailor when fourteen years of age, and for thirty-six years commanded sailing vessels on the lake. He became master of the bark Ontario, owned by his father, in 1858. Later he was master of the Roanoke, in which he owned an interest, and subsequently sailed the Henry R. Seymour. For seven years after he commanded the Lone Star and was part owner. He next sailed the Newsboy and was on her several years, being principal owner. Later he sailed the Eagle Wing, Saveland and other vessels. The last vessel he sailed was the schooner Ida. Racine had been Capt. Gallien's home for half a century.—Milwaukee Evening Wisconsin.

Mr. T. H. Ismay, of the White Star line, is perhaps one of the best authorities on what merchant cruisers can or cannot do. As to the big Oceanic, now building at the works of Harland & Wolff, Belfast, Mr. Ismay says she would be able to steam 23,400 nautical miles at a speed of 12 knots, or practically round the world, without stopping anywhere for coal. He also refers to one of the smartest bits of work ever recorded in the annals of merchant shipping, when the Teutonic, in order to attend the naval review as an armed cruiser, mounted sixteen guns and made all other arrangements for discharging cargo, painting and provisioning in less than three days. She arrived at Liverpool on June 21 and sailed, completely equipped, for Spithead on the 24th. She sailed again for Liverpool after the 26th, landed her guns and left on the regular sailing date for New York, viz., June 30.

Detroit's naval reserve organization has reason to feel disappointed on account of the announcement that the Yantic, one of the old naval vessels that was to be loaned to them, is too long to pass through the locks of the St. Lawrence canals. The Yantic is 204 feet long, and Assistant Naval Constructor Gilmour, who has been investigating the question of size of locks in the St. Lawrence canals, reports that the greatest length over all of a vessel which can be safely locked though, is 184 feet. William Leslie, manager of the Collins Bay Rafting & Forwarding Co., who has had a great deal to do with passing vessels through the canals, says that the Saturn, which is owned by his company and is 184 feet in length over all, had been locked through the small locks of the canals only with the greatest difficulty, and he considers 184 feet about the limit of over-all length which it is safe to attempt to lock through the small locks.

In General.

Russia is about to follow the United States in adopting the principal of protection to home shipping. After the year 1900 the coasting trade of Russia must be done in vessels flying the Russan flag exclusively.

Among articles in the latest number of "The Record," published by the Association of American Draftsmen, is one by H. Rottmer of the bureau of construction and repair, navy department, dealing with calculations for curves of load and buoyancy, sheering stresses, bending moments and equivalent girder for a battleship.

Dimensions and speed of Queen Victoria's new yacht, as originally proposed, have been changed. The vessel is now to be 380 feet long between perpendiculars, 50 feet beam, 18 feet mean draft and of 4,600 tons displacement. She is to have a steel hull, with minute subdivisions; to be sheathed with teak, and coppered; to have twin screws; and to possess a maximum speed of 20 knots. Her coal supply is to be large enough to keep her at sea for prolonged periods. She is to be built at Pembroke, and is to cost about $1,250,000.

Sir Henry Bessemer is now in his eighty-fourth year and his name is honored in all countries, while his kind heart makes him beloved by all who have the great privilege of his friendship. He may be justly proud that by his invention the world is producing about 10,500,000 tons of Bessemer steel annually. He has said that these high figures do not adequately impress themselves on the people's minds; and suggests that we picture to ourselves a gigantic armor-plate, 100 miles long, 5 feet thick, and 20 feet high, as representing the output of steel every year by his process.—Engineering, London.

OFFICE OF LIGHT-HOUSE ENGINEER, 9th District, Detroit, Mich., August 31, 1897. Sealed Proposals will be received at this office until 3 o'clock P. M. of Tuesday, the 21st day of September, 1897, for North Manitou Light Tower, Michigan. Plans, specifications, forms of proposal and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects.
M. B. ADAMS, Major, corps of Engineers, U. S. A., Light-House Engineer. Sept. 17.

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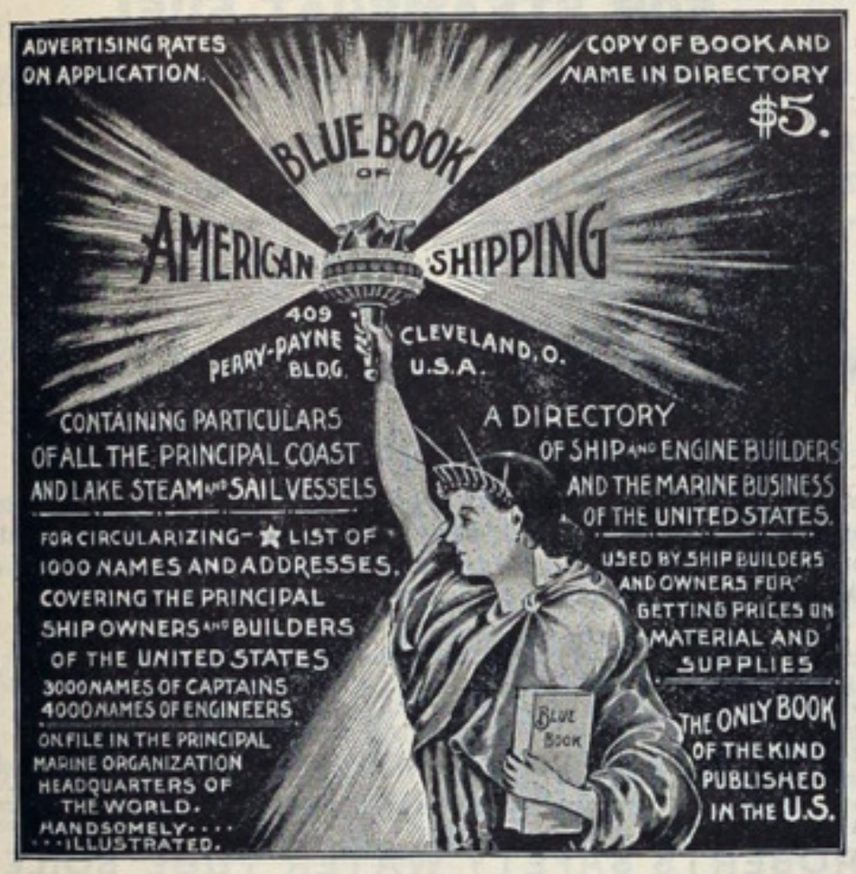
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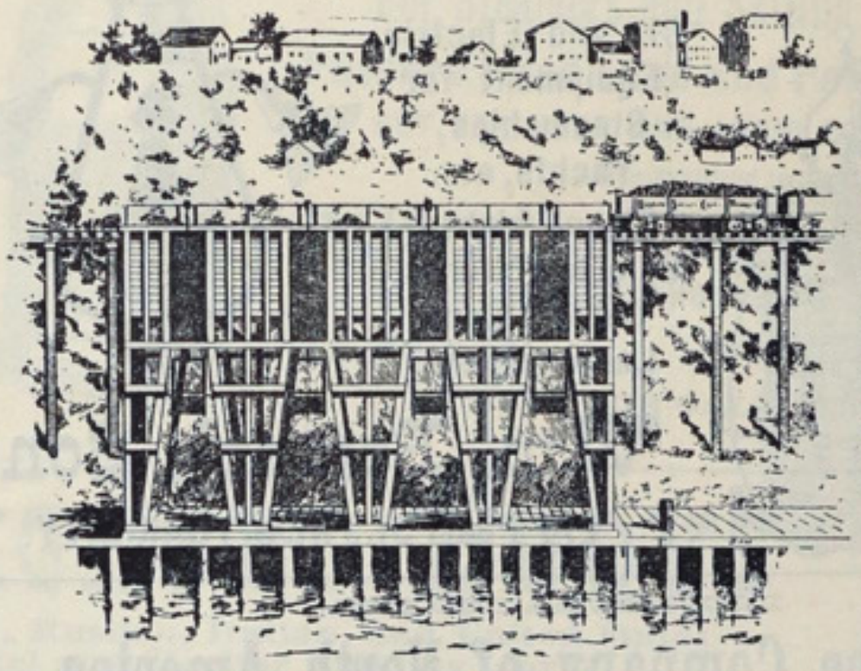

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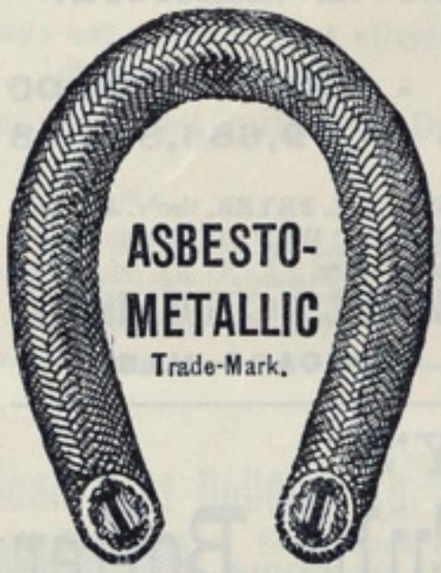

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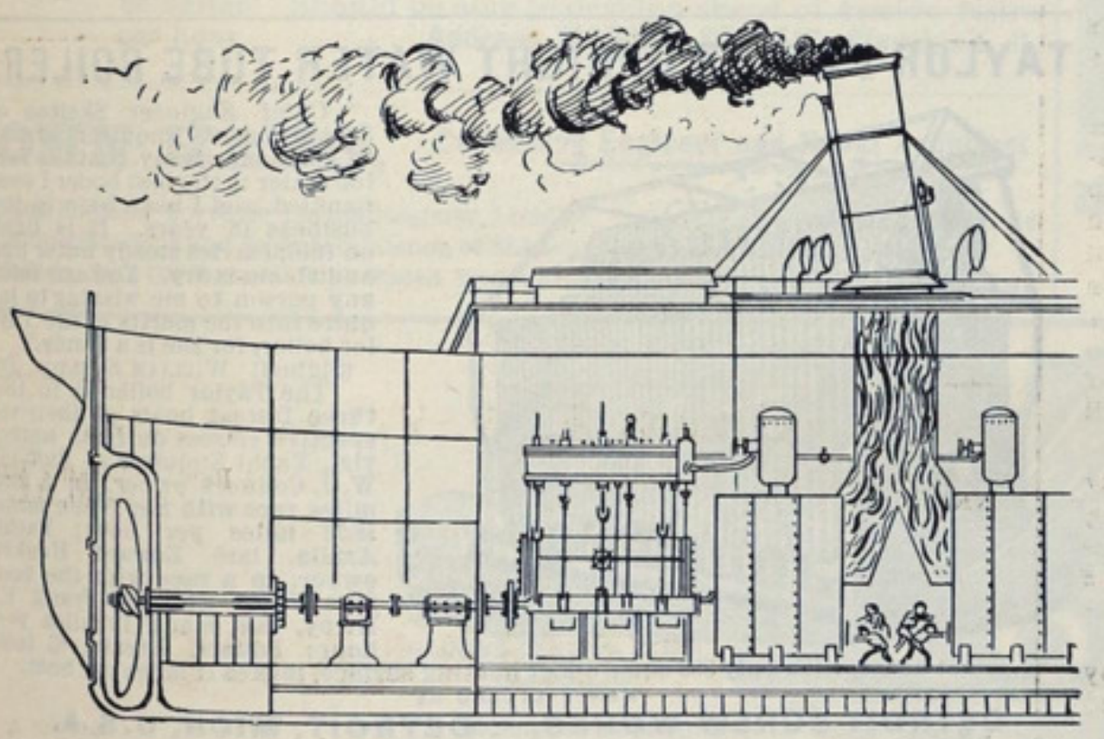

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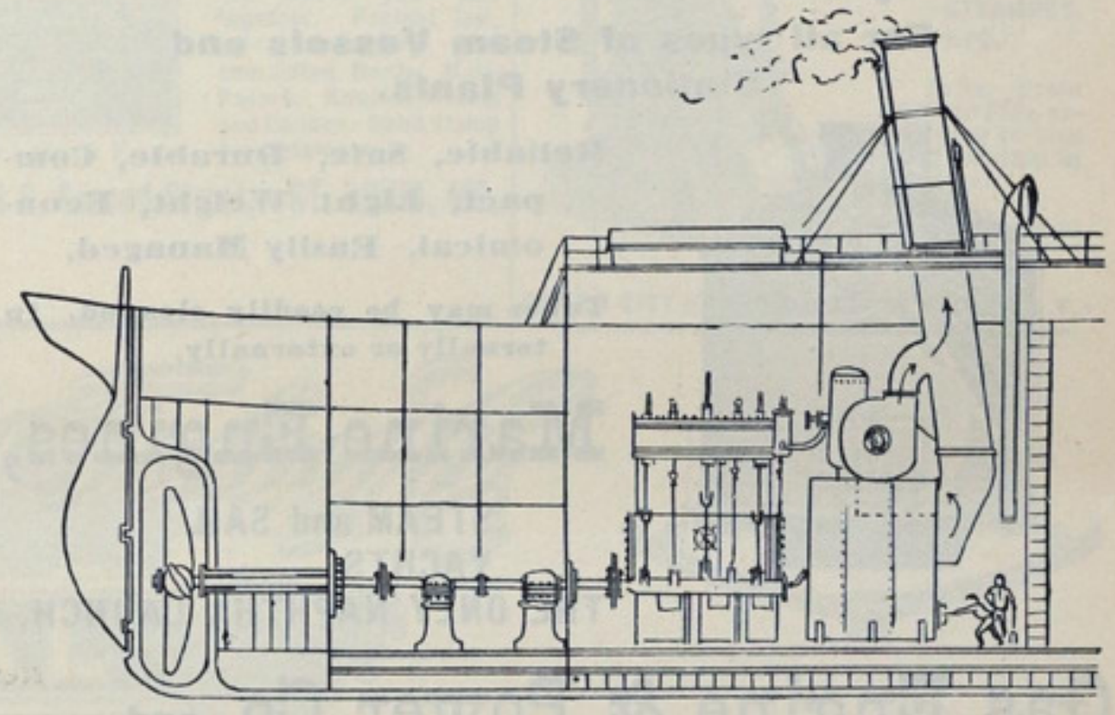

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ENGINEER'S DEPT.										% Saving.
Fuel, 165 tons	$348	62				$261	46			25
Oils	15	14				15	14			
Repairs	1	00				1	00			
Supplies	11	66	$376	41		11	66			
STEWARD'S DEPT.								289	26	
Provisions	119	20								
Supplies	3	37	122	57				122	57	
Handling Cargoes (unloading)	364	40								
Hull Repairs	20	25								
Towing	12	00								
Chandlery	1	38								
Sundry	13	15	411	18				411	18	
WAGES—ELEVEN DAYS.										
Captain.....$175.00 per mo.	64	16				64	16			
Mate.....80.00	29	33				29	33			
2d Mate.....56.00	20	54				20	54			
2 Wheelmen.....34.00 (12.46)	24	92				24	92			
2 Lookouts.....34.00 (12.46)	24	92				24	92			
1st Engineer.....112.50	41	25				41	25			
2d Engineer.....80.00	29	33				29	33			
2 Greasers.....34.00 (12.46)	24	92				24	92			
3 FIREMEN.....34.00 (12.46)	37	38				37	38			33⅓
4 Deck-hands.....17 00 (6.23)	24	92				24	92			
1st Cook.....60.00	22	00				22	00			
2d Cook.....17.00	6	23	349	90		6	23	349	90	
Total Expenditures			1260	06				1172	91	

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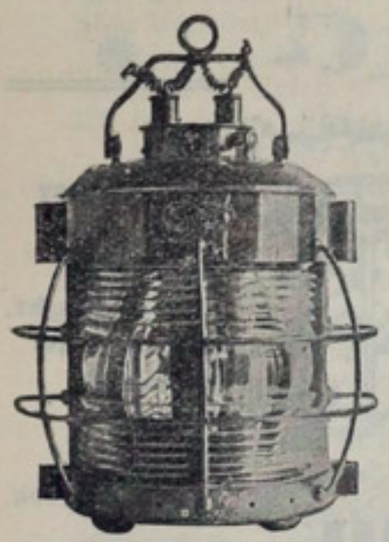

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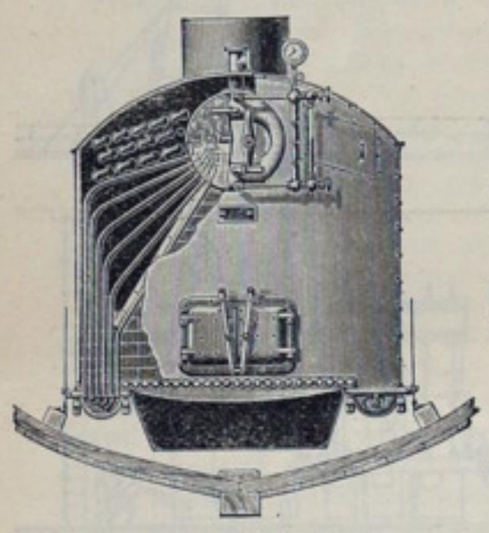

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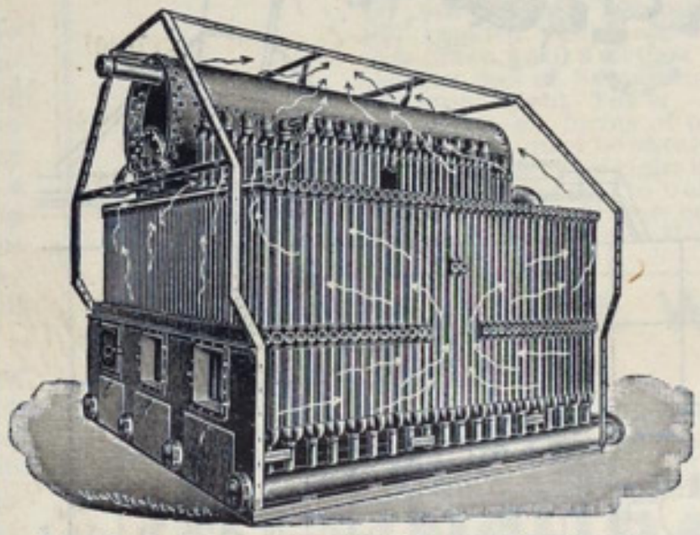

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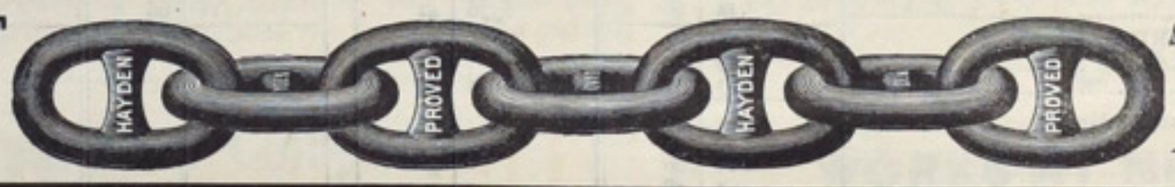

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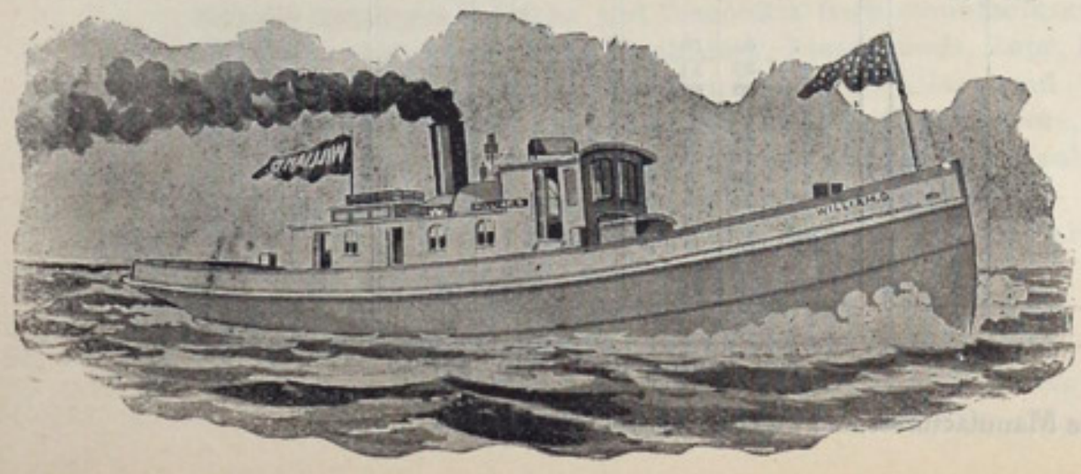

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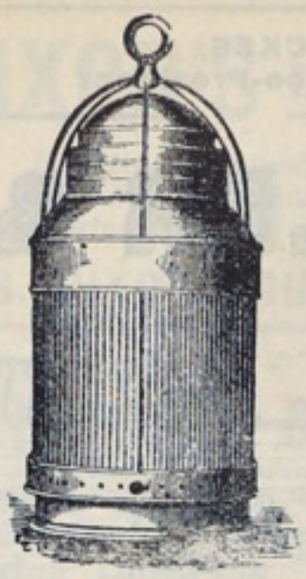

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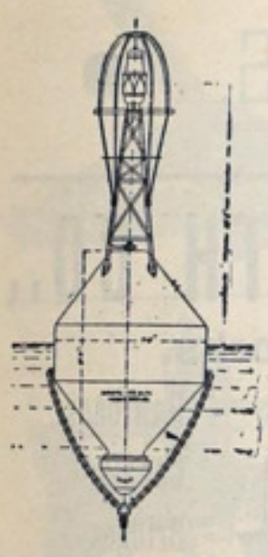

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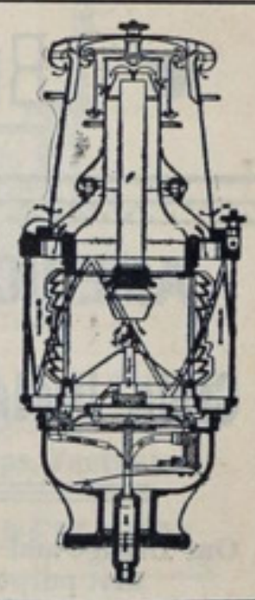

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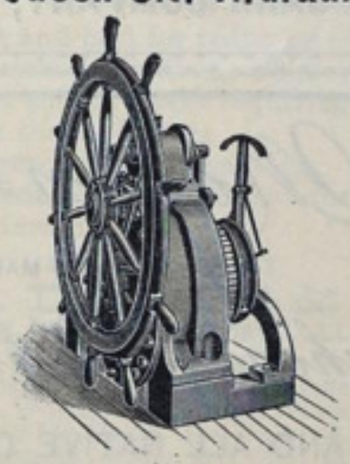

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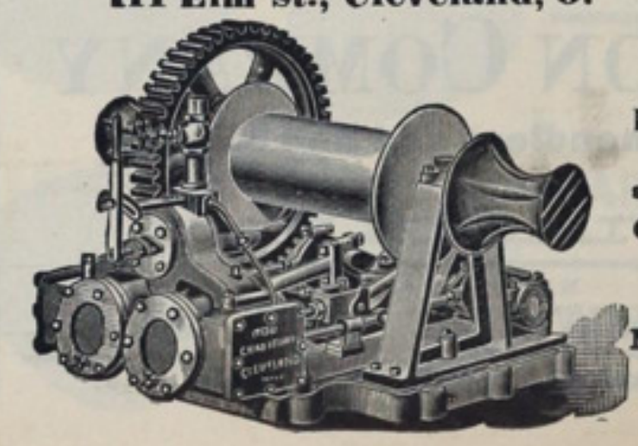

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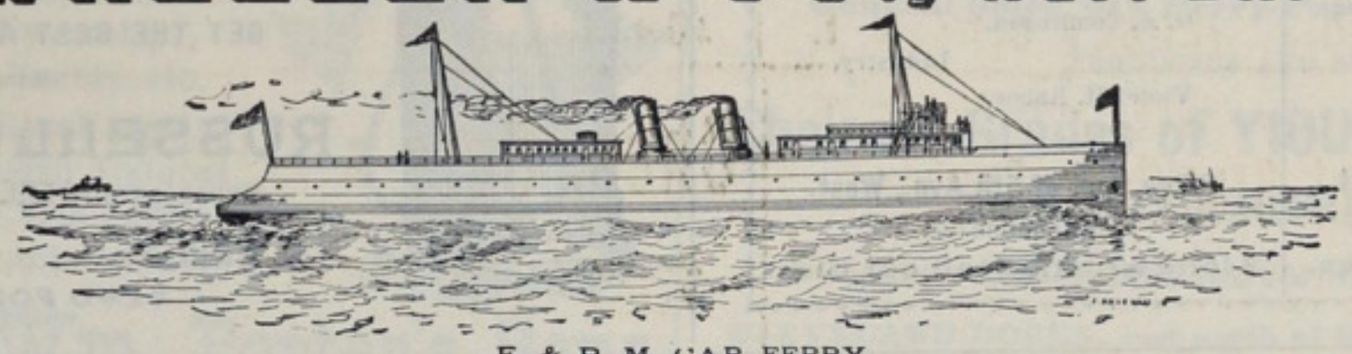

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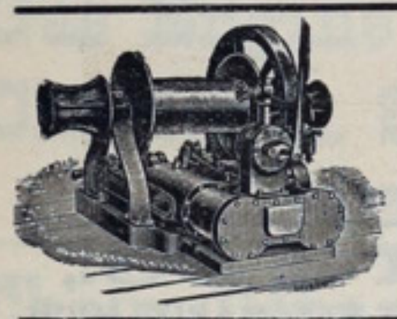

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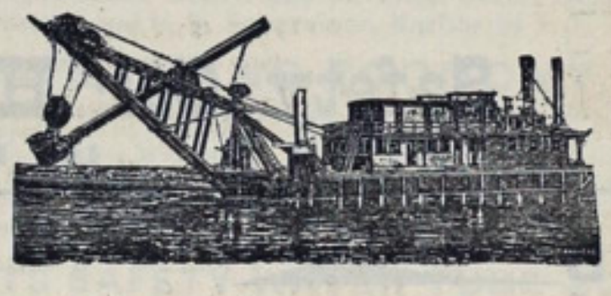

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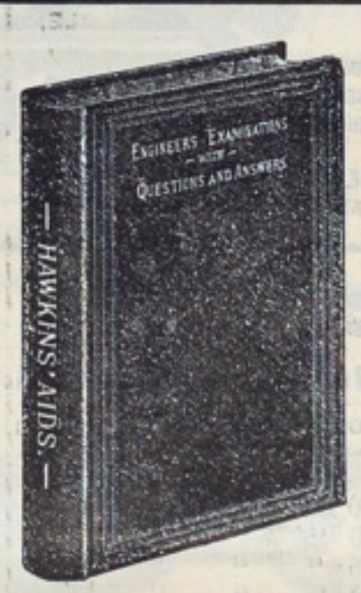

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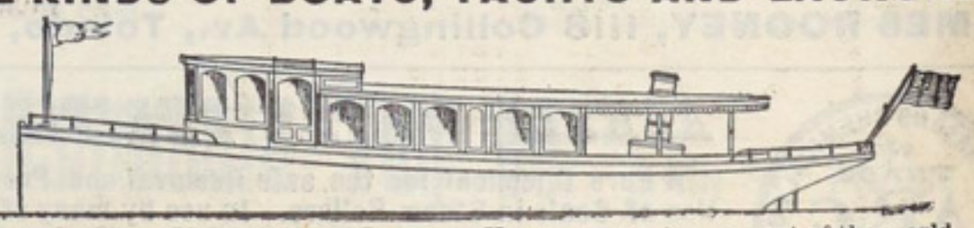

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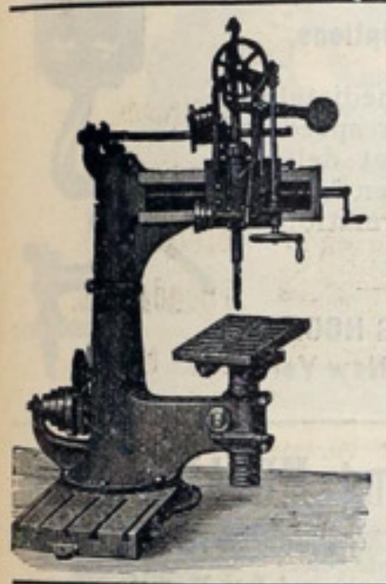

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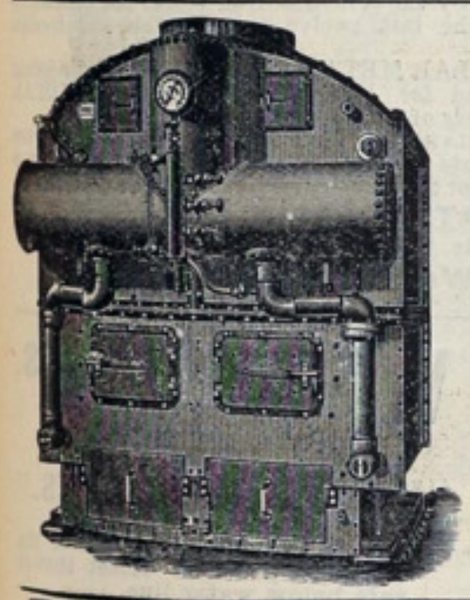

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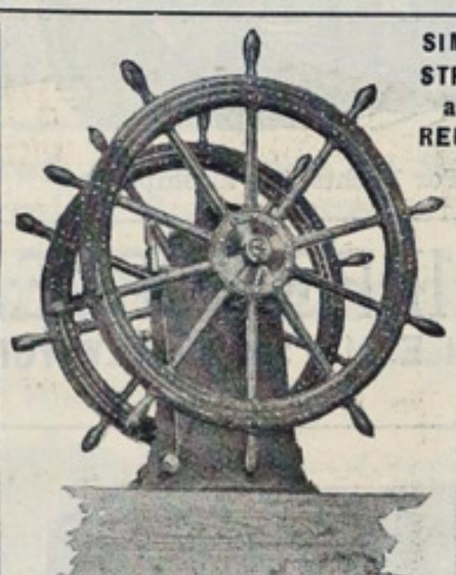

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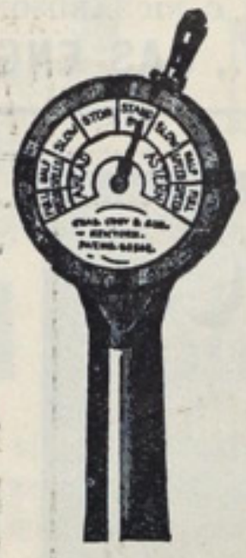

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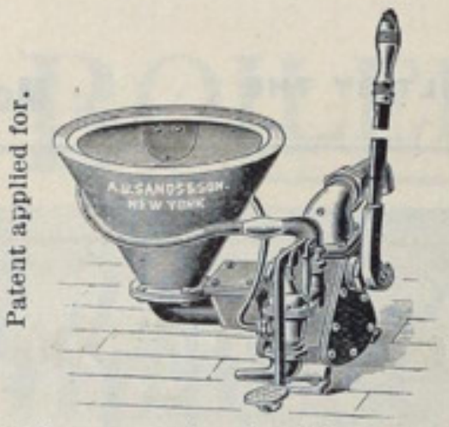

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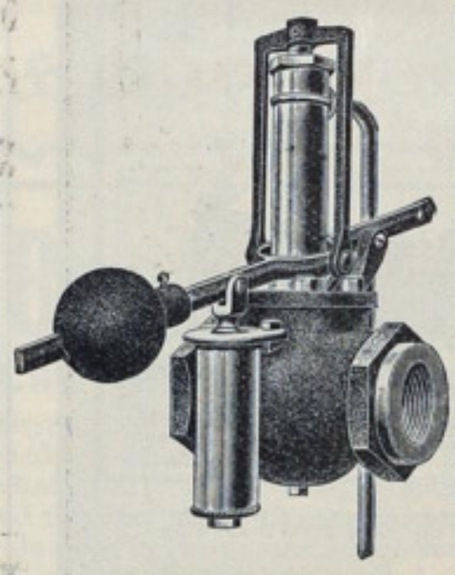

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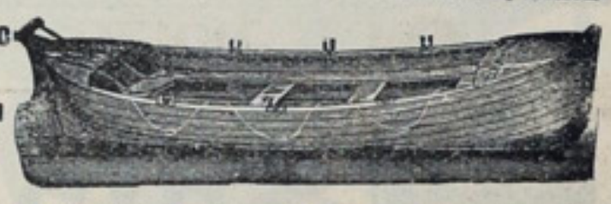

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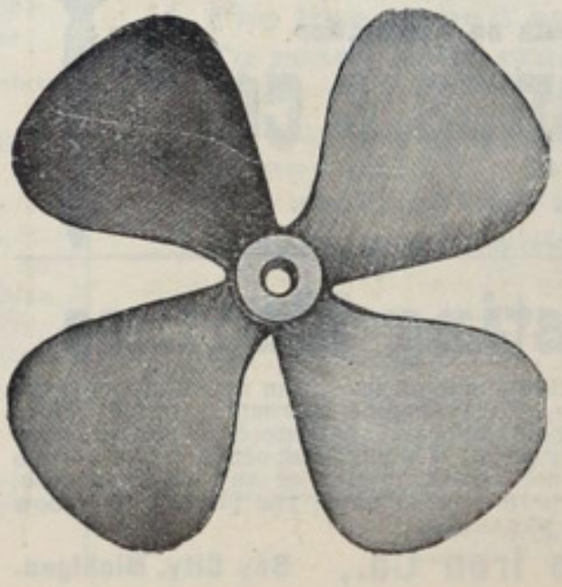

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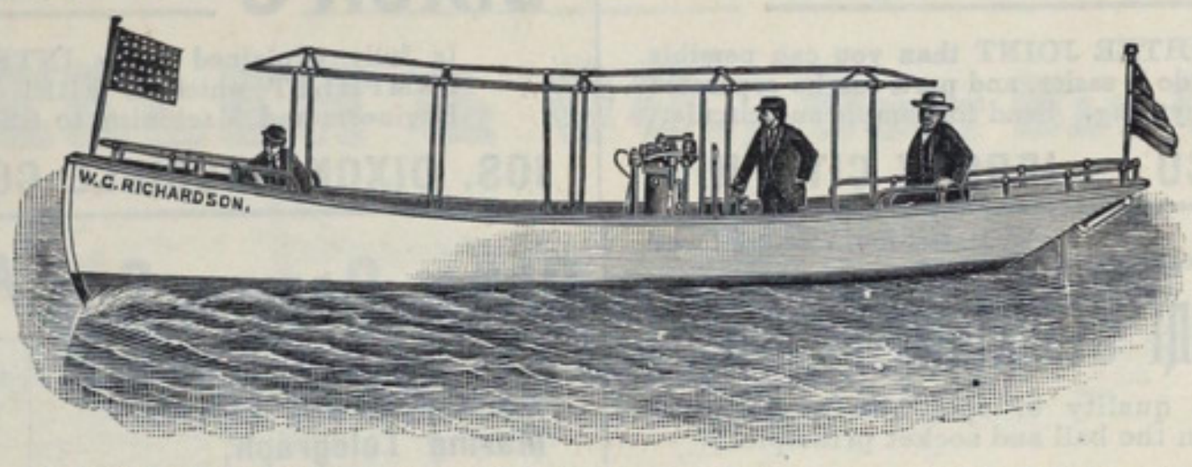

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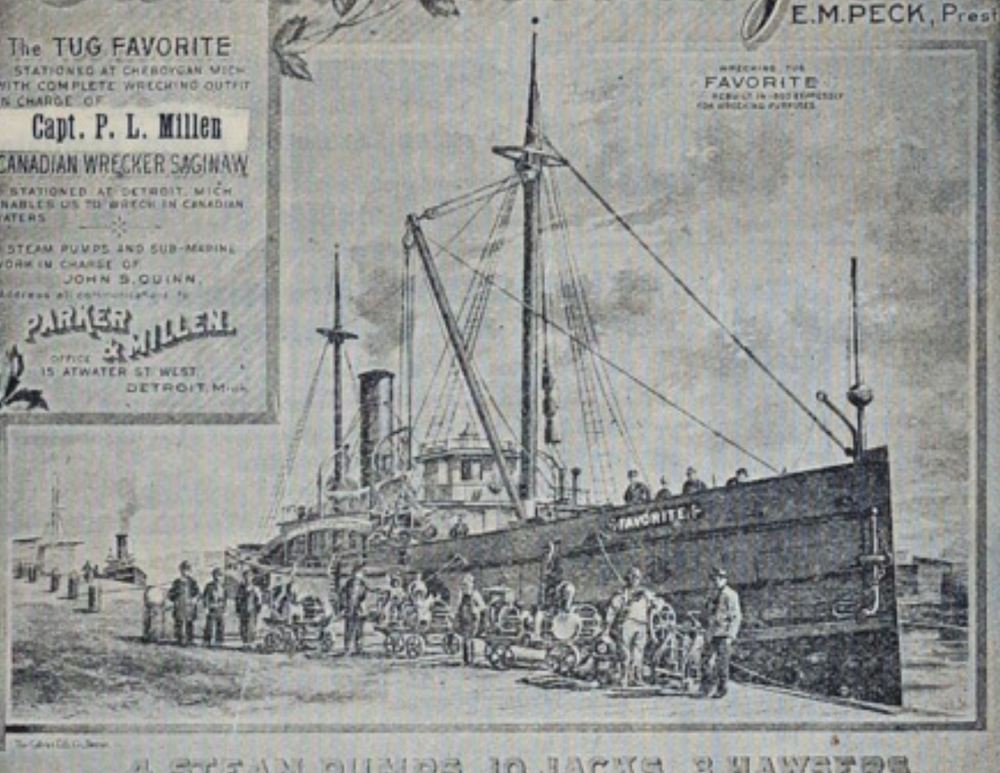

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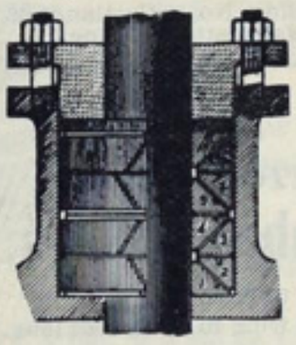

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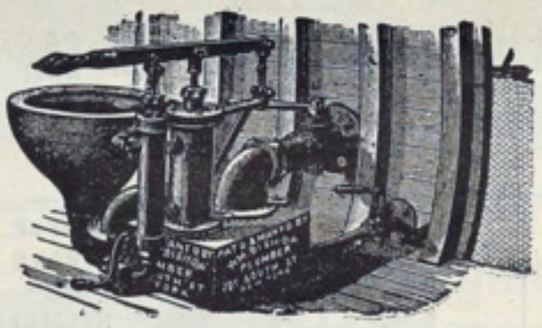

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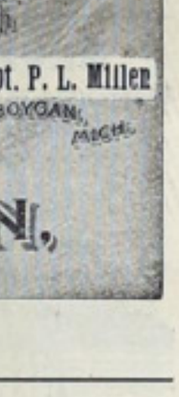

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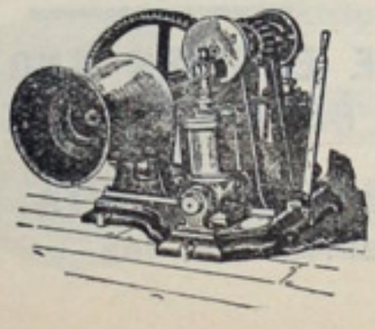

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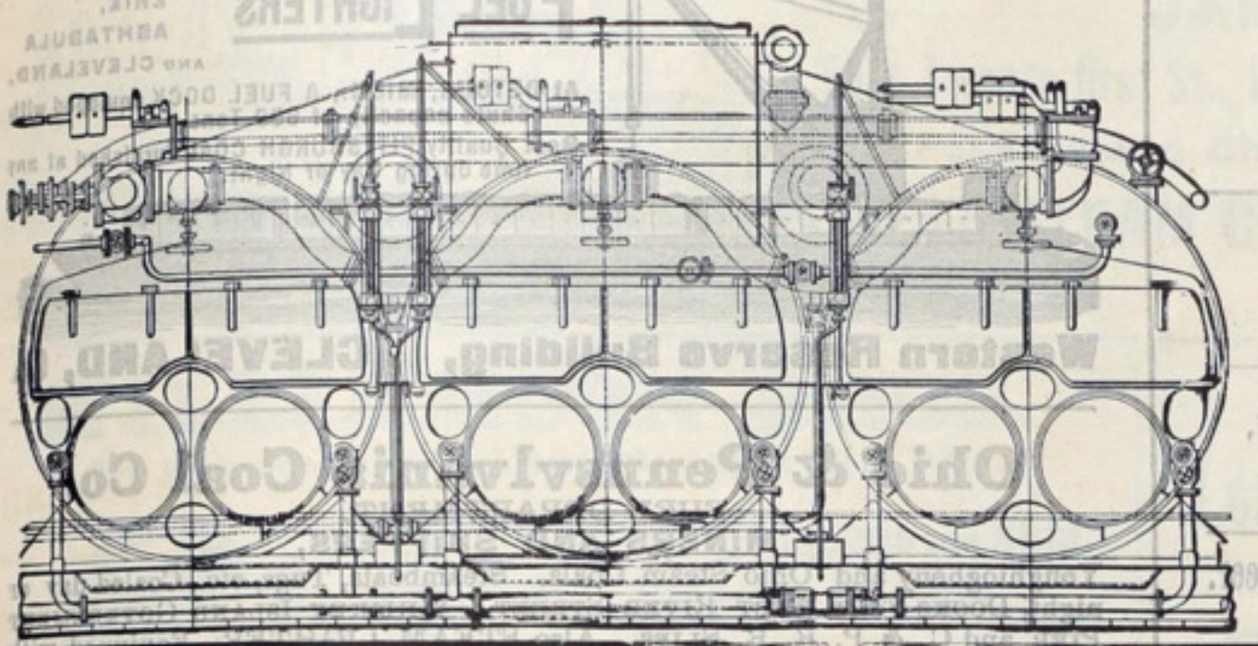

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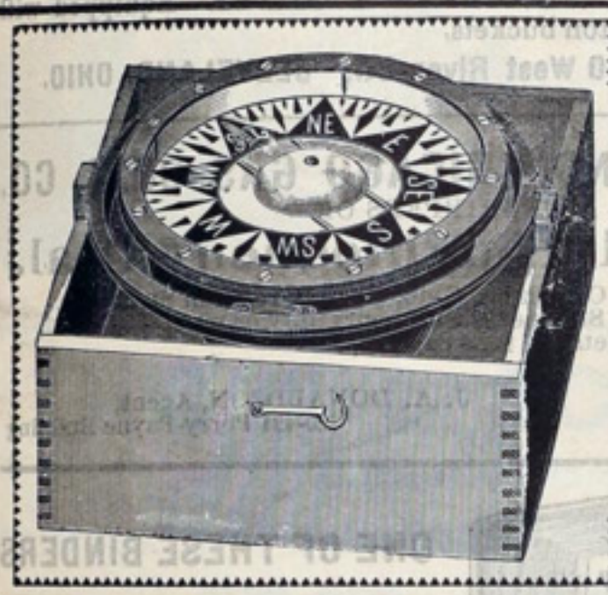

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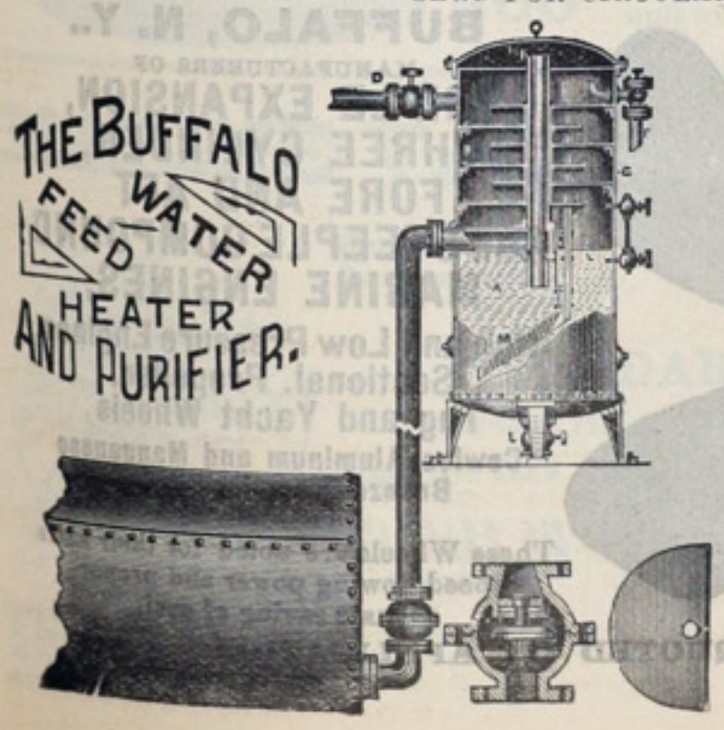

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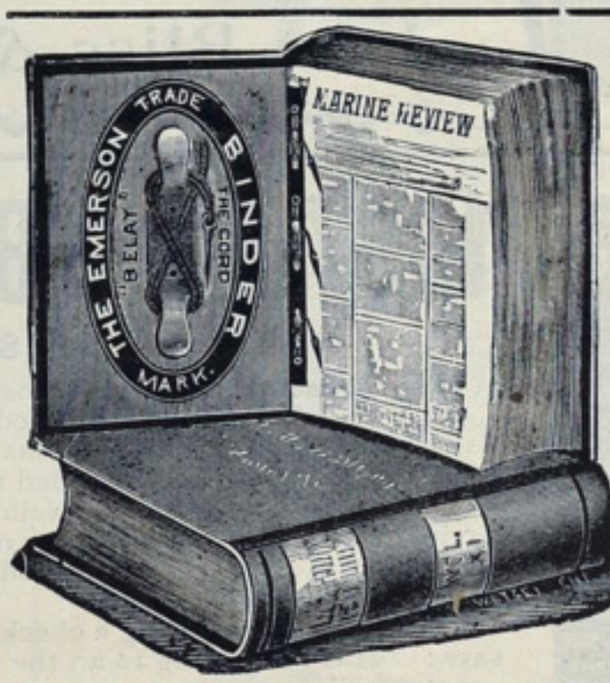

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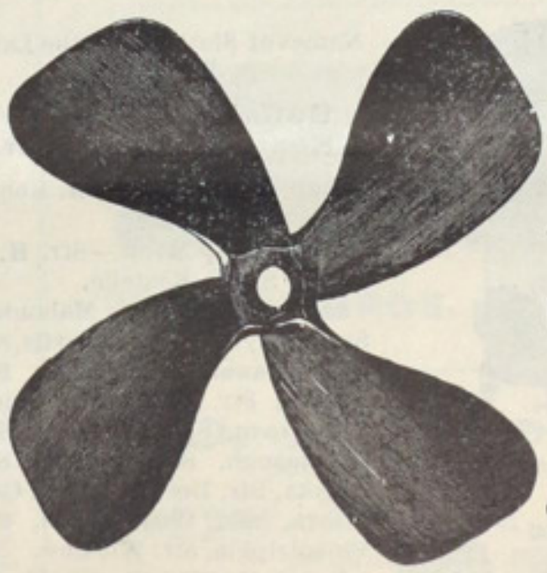

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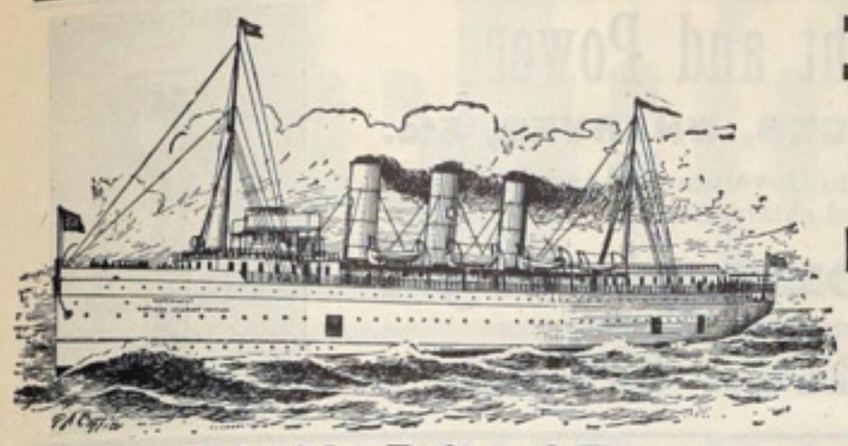

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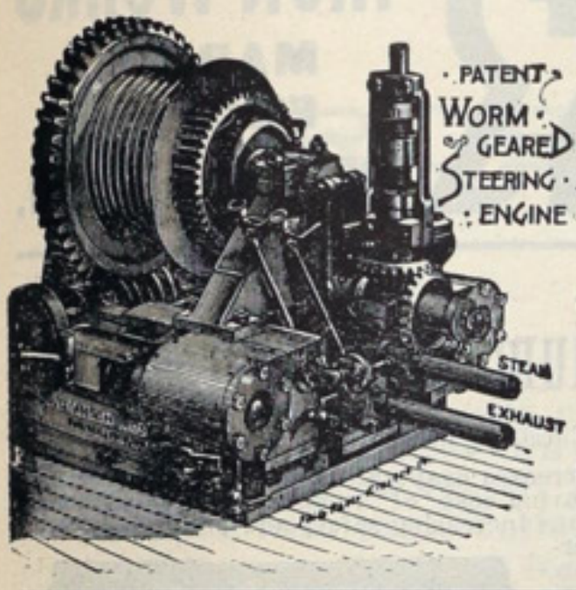

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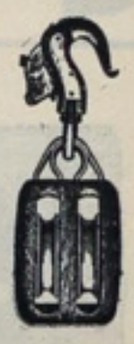

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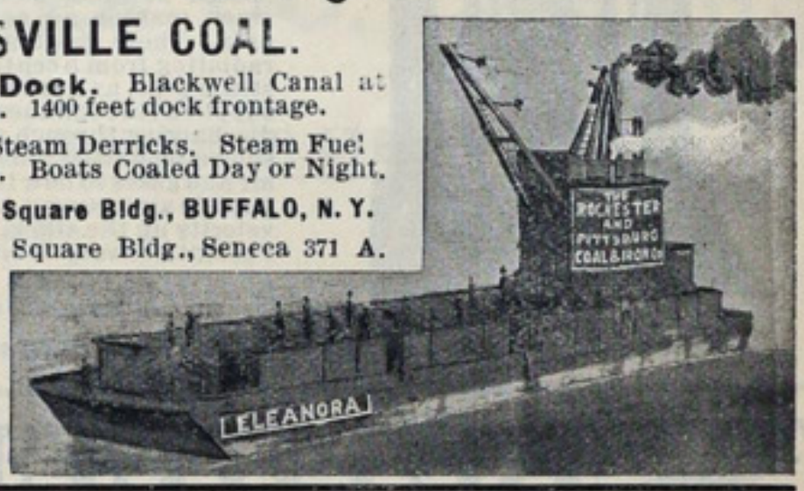

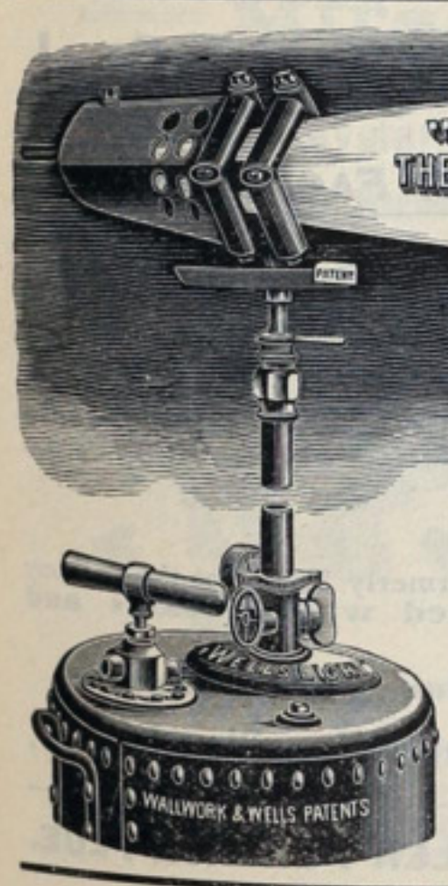

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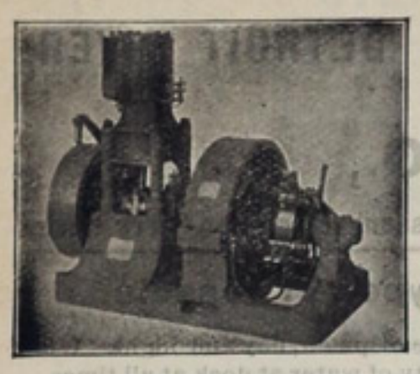

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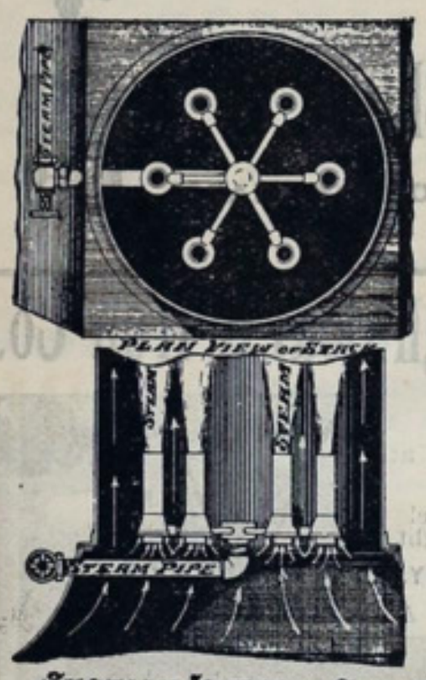

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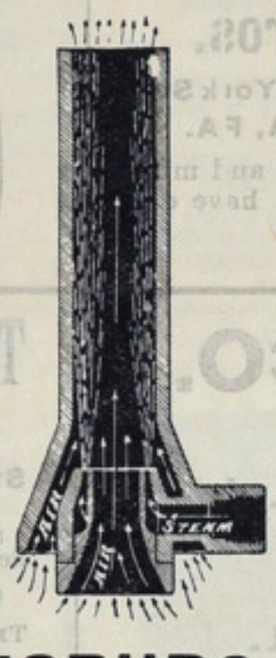

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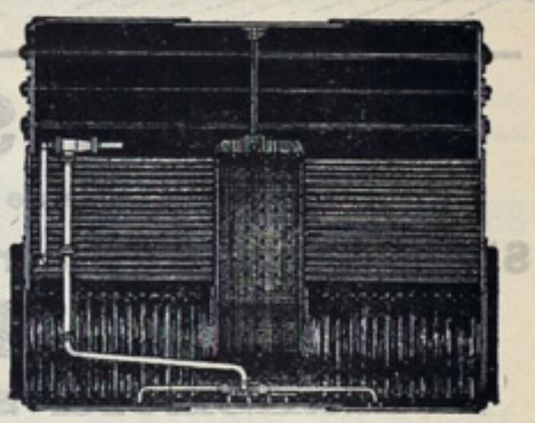

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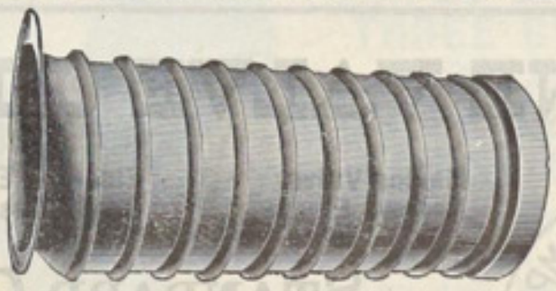

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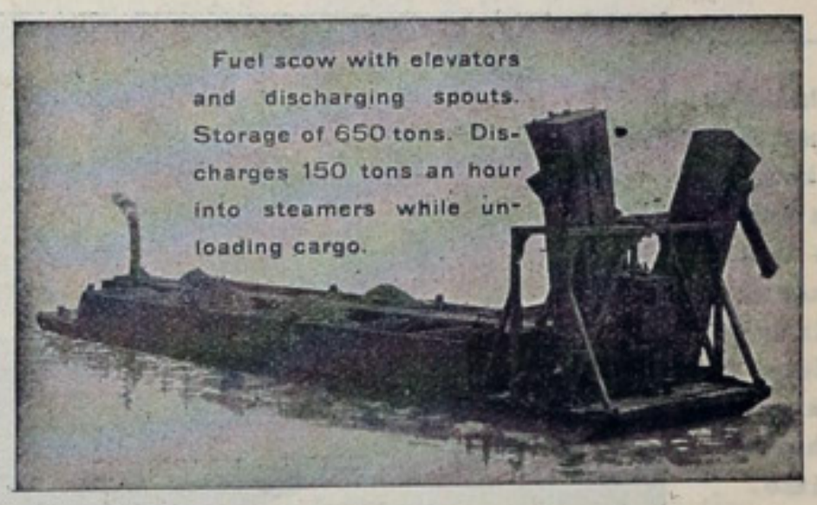
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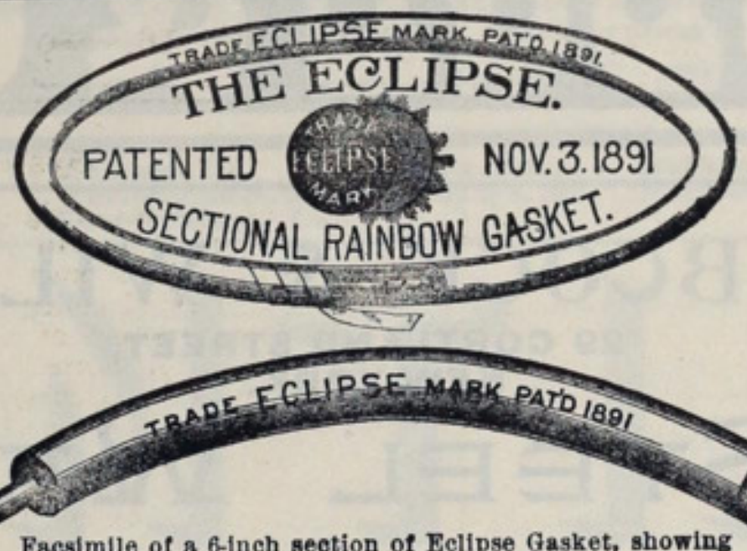

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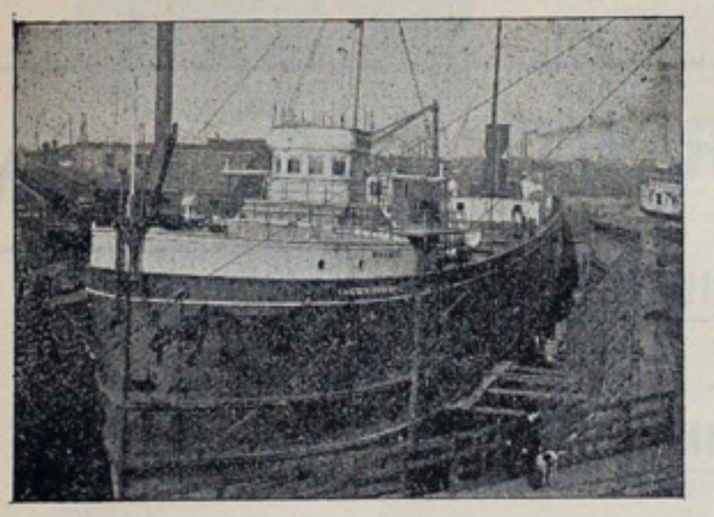

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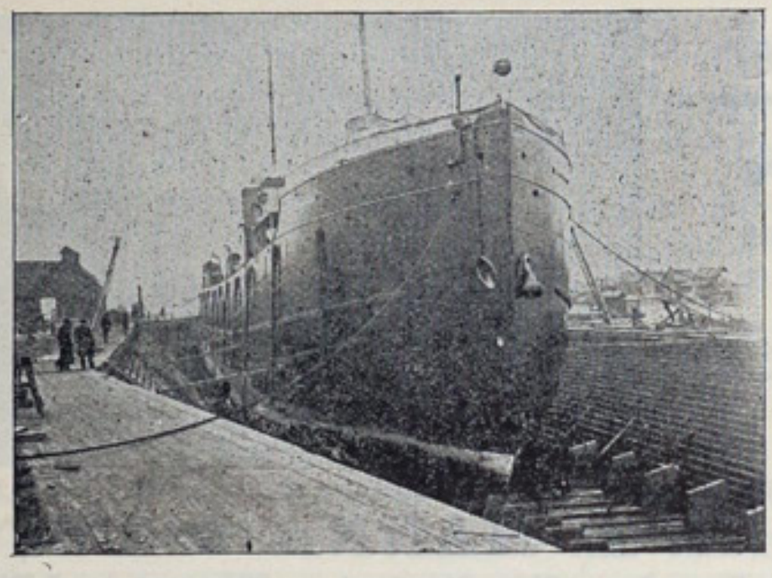

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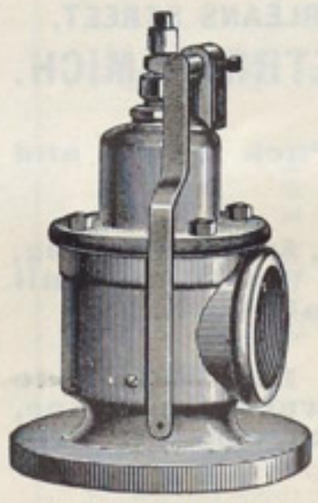

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